MODEL Airplane NEWS

FEBRUARY 1942
20c

S THE AMERICAN BOY TO BE GROUNDED?

(page 2)

THE ENGINE THAT CAN "TAKE IT"!

SUPER-CYCLONE

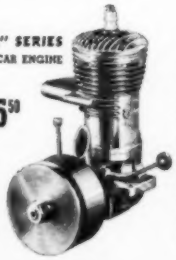
.... is not only the world's greatest all-around engine in performance and value, but it is built to deliver that performance under the most gruelling competitive tests and over a long period of time. This is of vital importance to the purchaser of any miniature engine because of the possible effect of the National Emergency on the model industry. The Office of Production Management has granted Aircraft Industries Corp. permission to complete a large production of SUPER-CYCLONE engines according to the same specifications that have made it outstanding in its field. Our fundamental belief is that National Defense must come before all other considerations, and it is possible that the engine you buy today may have to last you a long time. Therefore, you MUST select the engine that starts as the all-around leader and STAYS that way—SUPER-CYCLONE. Many owners report that their SUPER-CYCLONES are running better than ever after two years of service. SUPER-CYCLONE is the finest and most complete engine, with more outstanding engineering features than any other on the market .... and the proof of its performance is written on the Honor Roll for all to read.

THE "G" SERIES AIRPLANE ENGINE **$16.50**

SUPER-CYCLONE ON THE NATIONAL HONOR ROLL

- Winner of the National Rail Track Championship
- First Place in Quarter-Mile Cable Track Race Cars
- Longest Airplane Flight of the Meet (All Classes)
- First Place in the Junior Class "C" Airplane Event
- First Prize for the Most Consistent Performance
- Only Engine to Win Both on the Track and in the Air
- Only Race Engine under $35.00 to Place in First 20
- All Winning Engines Privately Owned and Operated

"G-R" SERIES RACE CAR ENGINE **$15.50**



The "G-R" Series -- While the "G" Series engine is designed exclusively for airplanes, the "G-R" can be used successfully in planes, pilot-planes (U-Control), racing hydroplanes and race cars, and has set more world's race car records than any other engine on the market. It's the most versatile engine you can buy!

FLASH—TO U-CONTROL PILOTS .... Thomas Herbert of Dallas, Texas, has just established a new world's high speed record for pilot planes at 85.06 M.P.H. with SUPER-CYCLONE.

SPECIAL NOTICE

In order to maintain SUPER-CYCLONE'S high quality of materials and craftsmanship in the face of rising costs, it is necessary for us to raise the price of our engines. This advance has been held to the minimum that will permit us to build the identical engine that has established SUPER-CYCLONE prestige, and will go into effect on January 1, 1942. All orders received before that date will be filled at the previous rates. It is imperative that you place your order at once, not only to effect a saving, but because our growing backlog of orders must be filled in rotation. Mail your order blank today!

50% DISCOUNT FOR YOU!

In buying SUPER-CYCLONE direct from the manufacturer, you obtain the world's most complete engine for 1/2 price. Thus you get an engine that would retail through dealers for $29 for only $14.50, or a $35 engine for $17.50

ORDER BLANK

AIRCRAFT INDUSTRIES CORP., GRAND CENTRAL AIR TERMINAL, GLENDALE (Los Angeles) CALIFORNIA
HOME OF THE FAMOUS CURTISS-WRIGHT TECHNICAL INSTITUTE

Please send me the items checked.
I enclose POST OFFICE MONEY ORDER:

SUPER CYCLONE "G" SERIES
The Airplane Engine, Complete with Mounts and Fully Assembled

- ☐ Upright Single Ignition . . $14.50
- ☐ Upright Dual Ignition . . $16.50
- ☐ Inverted Single Ignition . . $15.00
- ☐ Inverted Dual Ignition . . $17.00

PROPELLERS — Finest Quality Obtainable (☐ 14", ☐ 13", ☐ 12") . . 50c
☐ Steel Mounting Brackets . . . 50c

SUPER CYCLONE "G-R" SERIES
The Race Car Engine, Complete and Fully Assembled

- ☐ Single Ignition $15.50
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MA-2

ON THE BEAM

Is The American Boy To Be Grounded?

IN THE SAVAGE struggle between conflicting ideologies gripping the world today, those tests of strength which have taken place at sea have invariably been won by Britain. The reason for these shining victories becomes apparent when it is considered that the English boy is trained from childhood in the tradition of the sea.

ON THE OTHER hand, the formidable German army has crushed a continent under its timetable tank treads. And the reason for these swift land successes is also apparent—whenever the tide of battle is in doubt the screaming Stukas blast away resistance and pluck triumph from the field.

BEHIND THESE effective Stukas is twenty years of farsighted effort, twenty years of model building and glider flying, twenty years of training fuzzy eaglets to become the Roc of modern times.

THIS HUGELY successful air training program has finally been adopted by Britain. There, under national supervision with King George at its head, an Air Training Corps has been established to teach adolescents the theory of flight through model building. This A.T.C. of two hundred thousand boys is the reservoir from which will rise the tide of Continental air supremacy.

CANADA, IN STEP with the mother country, has her Air Cadets—boys from twelve to twenty who are uniformed like, and a part of, the R.C.A.F.

OF ALL THE countries on this planet's tortured face, our country is the most suitable for flying and therefore should be supreme in the skies as England is at sea and Germany by land. But the United States, where the airplane was born, has no long range policy for the air-minded boy. Worse, priorities threaten to shut off materials and ground the American model plane builder for the duration.

ONLY AFTER a rain of bombs that gushed flame and destruction did Britain heed the obvious Nazi lesson; though Canada needed no baptism of fire before acting.

NOW THAT WE are at war—it is no time to ground the American Boy!

13TH YEAR OF PUBLICATION

MODEL Airplane NEWS

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Edited by
Charles Hampson Grant

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Flight of Mitibushi Kinsei long range bombers with Junkers wings and tails and Boeing fuselages

AIR FIGHTERS OF THE "SETTING" SUN

The truth about Japanese air power and planes our boys will combat

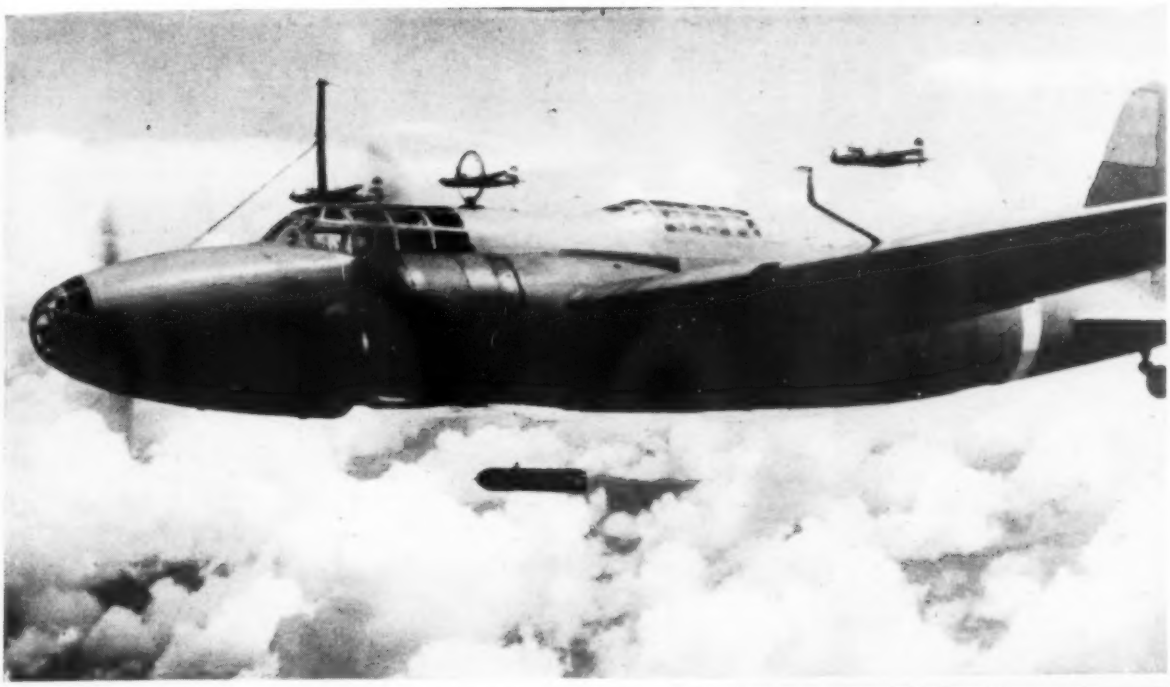
by LARRY McROBERTS

SO NOW we are in it! So now the United States is fully embroiled in the greatest political, economic and military conflict in all of history. None of us, for the past year, has had any doubt as to the involvement of America in World War II —eventually. But the cowardly, treacherous manner and suddenness of the Japanese attack, like a thief's knife in our back, left the United States stunned for many days. Now our President has discussed the situation with us, our radios have reported to us continually and our newspapers have informed us daily of latest developments. Now argument and debate has ceased. Now America knows exactly where it stands, knows its foes and what they are! Knows, too, that it will be a long fight, a difficult struggle, one that shall not rest lightly on the shoulders of any of us. But fight we must and will until "the danger of such an attack will NEVER AGAIN threaten us."

All military strategy is based on offense. Defense is only for strength gathering for subsequent attack. Making up an offense are manpower, equipment, communication and prior knowledge of the enemy's strength, dispersal and logical line of attack. These elements we know about in our Army, Navy and Airforce. It behooves us then to explore the nature of our foe, particularly in the air. We know of Germany's vast air might: (War Wings Over Europe, MODEL AIRPLANE NEWS, Jan., 1940 issue), (Germany's Air Force Wages War, MODEL AIRPLANE NEWS, April, 1940 issue), and (New War Wings Over Europe, MODEL AIRPLANE NEWS, Dec., 1941 issue). We know of Italy's planes and men: (War Birds of Italy, MODEL AIRPLANE NEWS, Feb., 1936 issue). Now we must learn about Japan's aerial forces.

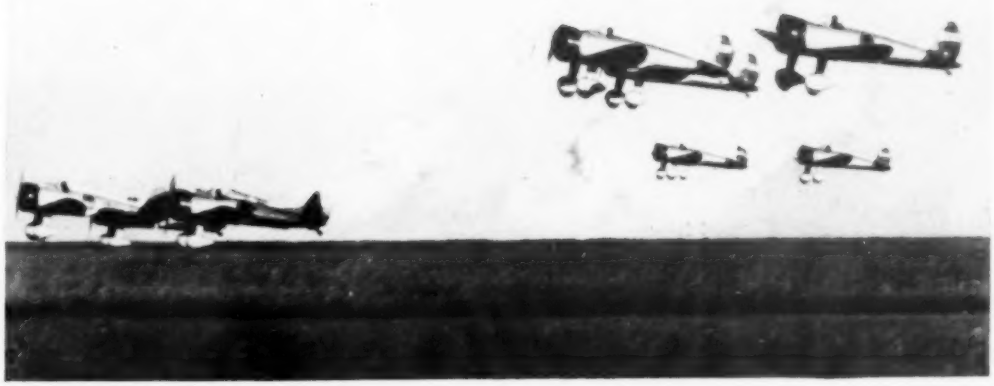
A dozen ingredients go into the building and maintenance of an airforce and in the majority of these Japan is sadly lacking. Not only in combat flying and tactical work can air power be said to exist, but in terms of aircraft manufacture, training of pilots, maintenance and fueling of planes, must an airforce be evaluated. In raw materials of aircraft construction Japan is the poor-

(Continued on page 58)



(Above) A Nakajima 19 bomber releases its load. Note similarity of fuselage to Douglas medium bombers — wings and landing gear to transport type

Japan's "Goodwill" plane, prototype of her long range Mitibushi bombers. (Extreme right) Nakajima 19 bombers, on the line ready for takeoff: Of fine workmanship but copies of American planes

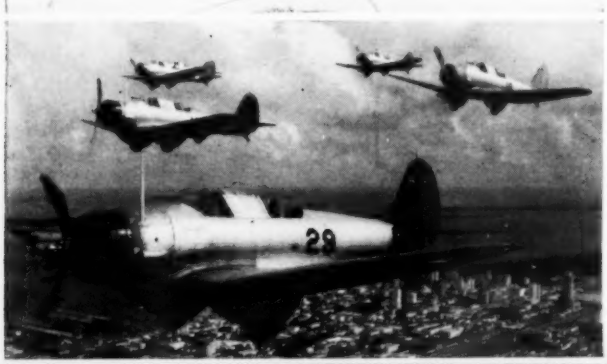


Mitibushi 96 single seat pursuit planes take off in formation: This type is similar to our Boeing P26-A

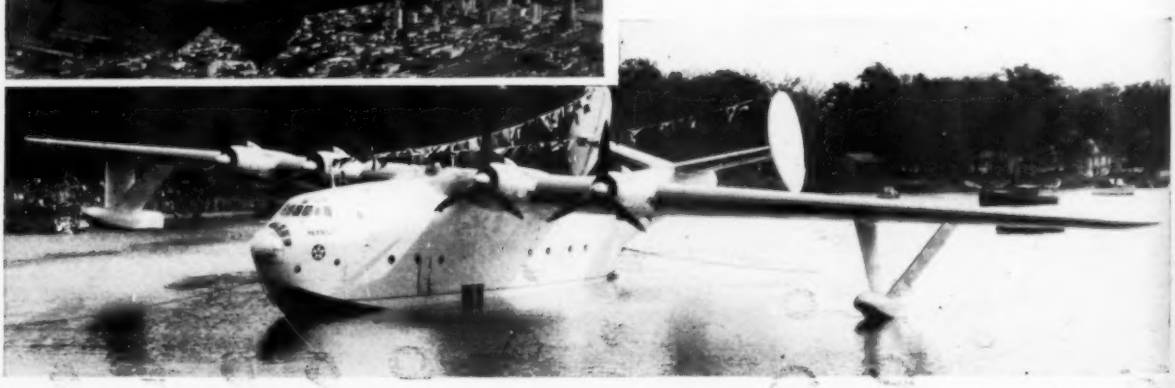
FRONTIERS

Aviation Headliners

(Above) The Russian DB-3a, medium bomber, the type that bombs Berlin. It carries 4400 lbs. of bombs. Note the ultra modern high speed design. (Right) Ferocious Curtiss Tomahawk fighters "prepared for action" in Libya; they have proved most efficient fighters. (Below) A Piper Cub joins the Army; the first military lightplane for liaison and observation. They are very effective in coordinating operations of ground forces because of their ability to fly slowly and get in and out of small fields.



(Above) A Stuka Ju. 87 dive bomber captured in perfect condition by the British in Africa. (Left) Flight of latest Navy Douglas dive-bomb trainers on their way to practice new bombing technique. (Below) "Flying Battleship," XPB2M-1, world's largest, launched at Martin plant, weighs 70 tons with cruising range of at least 6,000 miles



MODEL DESIGNING SIMPLIFIED

Making the layout drawing to required aerodynamic specifications

by **CHARLES HAMPSON GRANT**

ARTICLE 15

ANY undertaking appears simple if a plan of procedure is first established. The problem of design, making drawings for and building a gas model is no exception.

So far in previous articles we have established all those aerodynamic facts which will give the model the desired performance. A complete force layout was made, that would insure complete stability in all phases of flight. Around this setup the side view outline of the airplane was constructed.

The procedure followed this sequence because the most important thing in this contest model is to have the proper force arrangement. The structural outline is secondary. Many builders follow the reverse; first building their model to some pleasing outline and then trying to establish a stable force setup, or often many times ignoring it all together. Apparently those things which cannot be seen do not appear to be important; however in the case of model design the unseen forces acting on the plane are the fundamental cause of success or failure.

Now that we have established and assembled the complete design data for our gas model the second problem is to make a structural layout showing the outline of the model and aerodynamic units and the position of structural parts in the assembly. When this is completed details of each part may be considered. When indicating the parts position do not attempt to put in the complete detail for such procedure often requires changes later; it is nearly impossible to conceive the exact form of every part and the manner of assembly before

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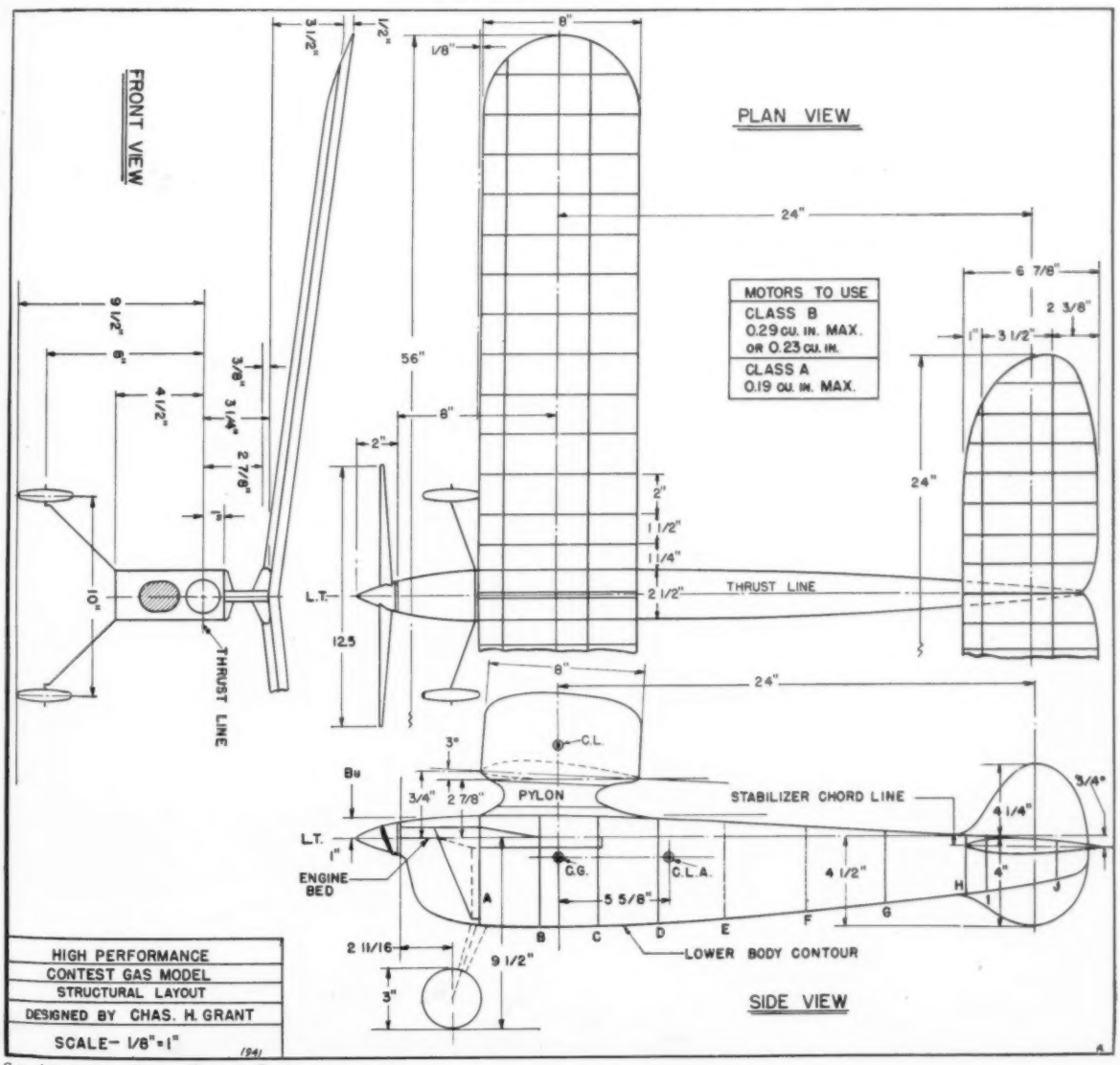


CALLING ALL ENGINEERS!!

Do you want a job in the aircraft industry?—A complete analysis of your problem—How to choose your occupation wisely

by **WILLIS L. NYE**

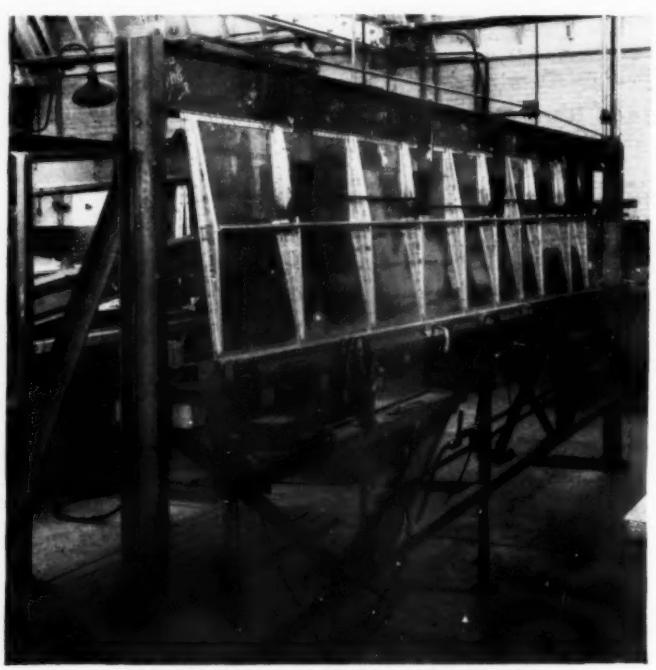
BREATHES there a modeler with a soul so dead, who never to himself has said, "this is my own, my chosen profession." Aeronautical engineering is no sinecure. It is not a profession that is especially inspiring, but somehow, each and every one of the model fraternity, harbors a desire to have a part in the technical development of aircraft. Although the technical headaches caused by the complex design problems may be multitudinous, there exists a self-satisfaction in taking a part in the program to make the United States master of the skies.

When Mr. John W. Model Engineer seeks a job in the technical phase of the industry, he finds the engineering department segregated into two parts, groups engaged in detail design and groups who undertake specialized phases of engineering. If the engineer's experience is limited, he may be classified as a junior detailer to start. The next higher ratings are senior detailer, junior layout, senior layout, group engineer, assistant and project engineers; certain specialists are also retained as staff engineers to engage in research and act as consultants. All ratings are assigned as far as possible on an experience and ability basis. Armed with a rating, the engineer is assigned, in most instances, to a detail design group; positions are also available in the specialized engineering groups for engineers with limited experience. The detail design groups are as follows:

Wing
Empennage
Fuselage
Engine Installation
Landing Gear
Hydraulics
Controls
Electricity and Radio
General Equipment
Armament

These detail design groups have an ample degree of latitude to suit the natural design talent of the junior engineer; for instance, in the electrical and radio group, the work is interesting to the modeler who has experimented with radio control models or electrical equipment such as radio transmitters and receivers. The junior engineer who is interested in the performance of internal combustion engines will find an excellent opportunity to further his knowledge of this subject in the engine installation group. This group makes the engine test run which is a very interesting phase of aeronautical engineering, and designs the airplane's cowls, plumbing, lubricating and cooling systems. Thus, it is noted, each group offers the tyro a specific phase of engineering. The other groups offer work of equally interesting nature and a beginner is wise who applies for assignment in a group suited for his natural preferences.

Each group is directed by a group leader, responsible to the project engineer in charge of the entire project. A group leader functions as the directing engineer in charge of minor detail design, makes necessary personnel reviews, complies with the established work schedules for dates of completion, determines where the jurisdiction of his group begins and where it ends as to the responsibility of design, and maintains a liaison with all other groups, the work of which may require coordination with his particular group. The quality of the work of an engineering department is no better than the quality of the group leaders. In short, the group leader functions similar to the non-commissioned officer in the Army. Therefore, the group engineer must be experienced in his work and able to direct the subordinates' work.



A wing flap being assembled in a fabricating jig

Design and detail groups engage in all phases of design and detail work necessary to complete some specific project; all necessary revisions of its part of the work are made on the drawings by each group. The group clerk makes records of all changes and the project slips attached to the drawings. Tool planning and tool design departments frequently must be contacted by an engineer of each group, mainly for the purpose of co-ordination. Each group also maintains liaison with the service engineering department, material control, weight and preliminary design groups. Thus, it is seen that the engineering department must function similar to a team; unless all departments or groups are coordinated, it is impossible to comply with an engineering work schedule.

The loftsmen comprise a precise engineering group. They are paid a slightly higher rate of compensation than the average engineer, commensurate with their experience. Fair lines and curves are plotted within .010 inches accuracy on the metal templates. Reference lines and dimensions are issued to each design group. Tooling holes are checked in the loft on the metal templates. The spline and the straight edge are the two tools by which the loftsmen attack their problems of complicated fair lines. Although the draftsman may develop corns on his elbows, the loftsman develops callouses on his hands, knees and elbows by virtue of the necessity to draft layouts to full size. If you prefer to do your work on your hands and knees, choose the loft.

The C.A.A. Liaison group coordinates the engineering design requirements to the satisfaction of the Federal Government, insofar as the procurement of the approved type certificates. All records of transactions relative to the procurement of the certificates are handled by this group. Revisions to the C.A.A. Regulations are also issued to the engineering department by this group. Formal application for the certificates of approval are undertaken by this group when prosecuting the quest of a coveted "C," in place of the "X" on some new commercial airplane. The engineers in this group should have extensive field maintenance experience, in addition to aeronautical engineering experience. A knowledge of structures stress analysis is necessary.

Material control is the name of a group assigned to determine the availability of materials and time necessary for delivery

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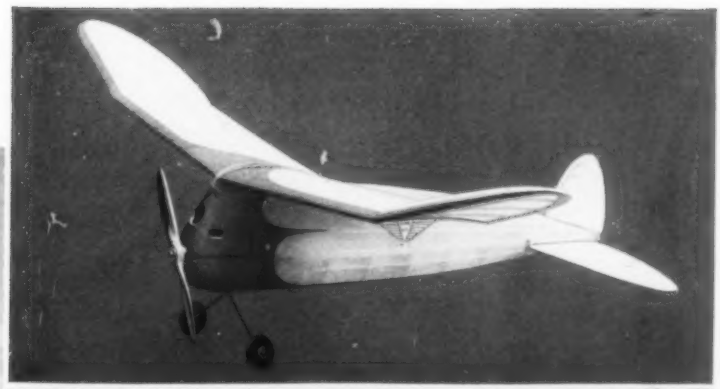

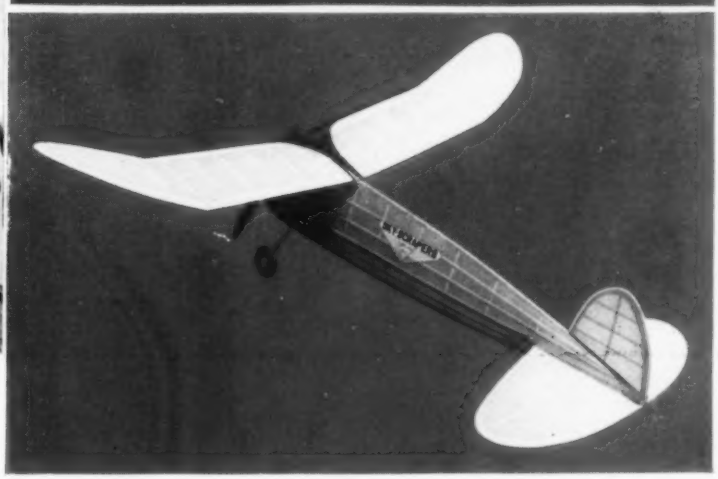

Though of simple construction it is a fine performer because of clean lines and excellent design

THE NATIONALS WINNING PACER

A consistent class C winning gas model that is easy to build

by **SAL TAIBI**

THE Pacer placed first in the open class "C" event at the 1941 Nationals. On its first flight, with a 7 second motor run, it flew for 1 minute and 22 seconds. The duration of the second flight was 13 minutes and 55 seconds, and the third and final flight was 10 minutes and 5 seconds.

There are many factors that make up a championship flight, and although luck is an element, the model itself must get up there quickly and then glide well enough to take advantage of lurking thermals. The ship must be consistent, stable, and a dependable flier that performs well under all conditions. The Pacer has these necessary "virtues" of a good airplane, and ever since the original was introduced in MODEL AIRPLANE NEWS, it has met with widespread popularity.

Class "C" ships usually outsoar the smaller class "A" and class "B" models, but their drawback is comparatively poor climb. The class "C" Pacer compromises between the fast climb and poor glide of smaller ships, and the exceptional glide and poor climb of larger ships. The result is a fast climbing class "C" model that gets up to the thermals, and then has the ability to take advantage of them. The Pacer is powered by a motor having a displacement of .35 cubic inches. Because it has a wing area of 562 square inches, the model has to weigh 31.4 ounces; it is simple, rugged in construction and flies easily.

Fuselage

The first step in building the fuselage is to draw the top view full size. An elaborate drawing is unnecessary; a center line with the width markings suffices. The formers and bulkheads are drawn full size on the plans and can be traced directly to balsa with carbon paper, or can, like the formers, be built on the plan.

1/4" x 1/2" gumwood is spliced to the two longerons before starting to build the "crutch." Former 1 is built of 3/16" x 1/2" balsa; 2, 3, 4 & 5, of 1/8" x 1/2" balsa; 6 & 7 of 1/8" x 3/8" balsa; 8 & 9 of 1/8" x 1/4" balsa; and 10 & 11 are cut from 1/8" sheet balsa. The bottom bulkheads are cut from 3/32" sheet balsa. While the crutch is drying, cut out the fire wall and bulkheads, and build the formers. After these have been cemented to the crutch, the 1/4" square top longeron is added. The 1/8" x 1/4" bottom stringers are then inserted in the bulkhead notches. Mark the formers where the 1/8" square stringers cross them, and cement the stringers in place. The fuselage wing rest (WR) is now traced off the plan, cut out, and cemented in place. 1/8" sheet is filled in beneath the top longeron and between the formers, to prevent the top longeron from sagging. The landing gear is bent to shape and glued to the firewall with pieces of 5/16" x 1/2" grooved basswood as shown on the plan.

3/32" O.D. aluminum tubing is securely cemented behind former 10. The tubing passes through the top longeron and through a 1/4" square brace that is cemented between the crutch longerons. This tubing is the pivot about which the rudder turns. A piece of 0.16 aluminum 7/16" x

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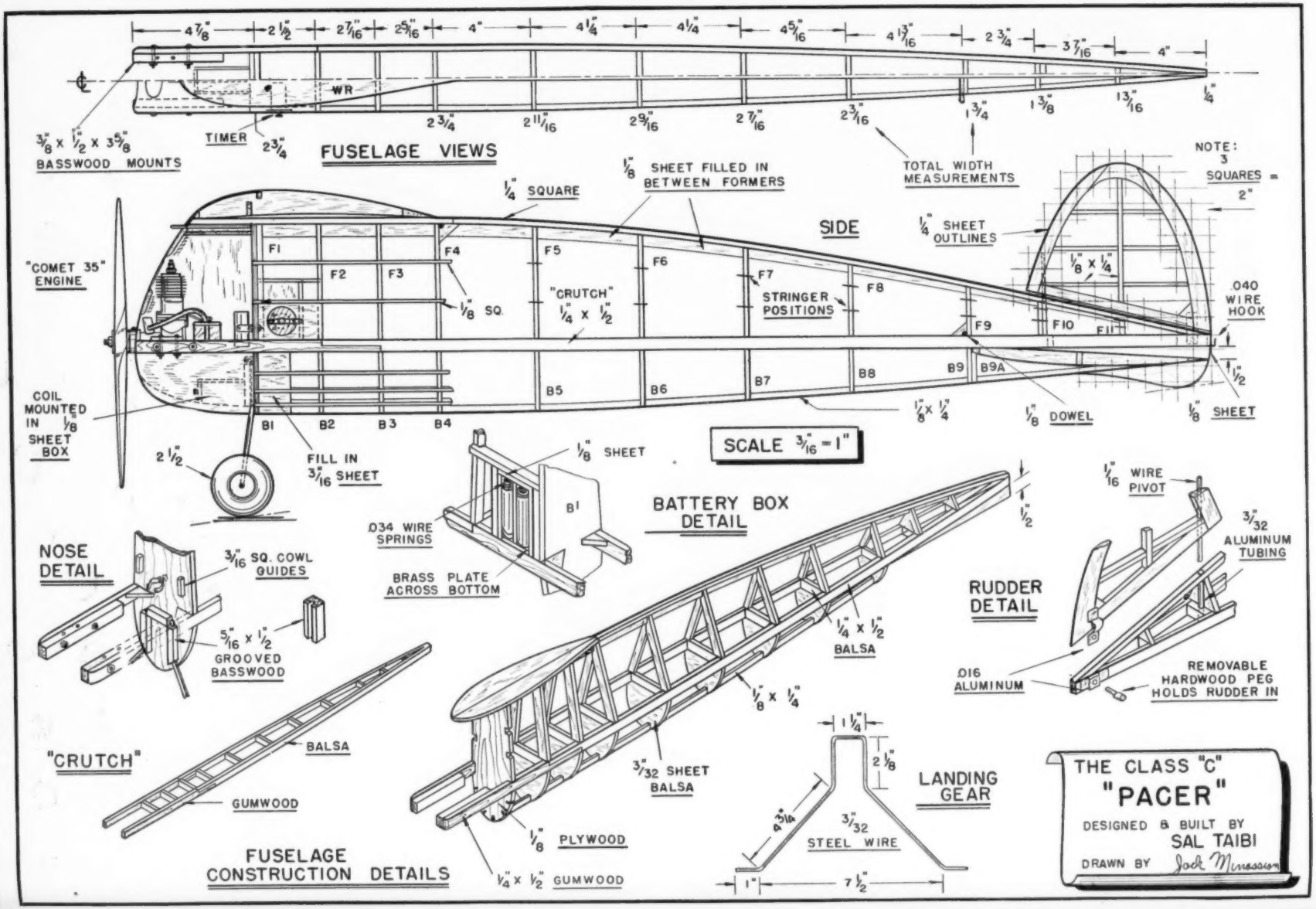
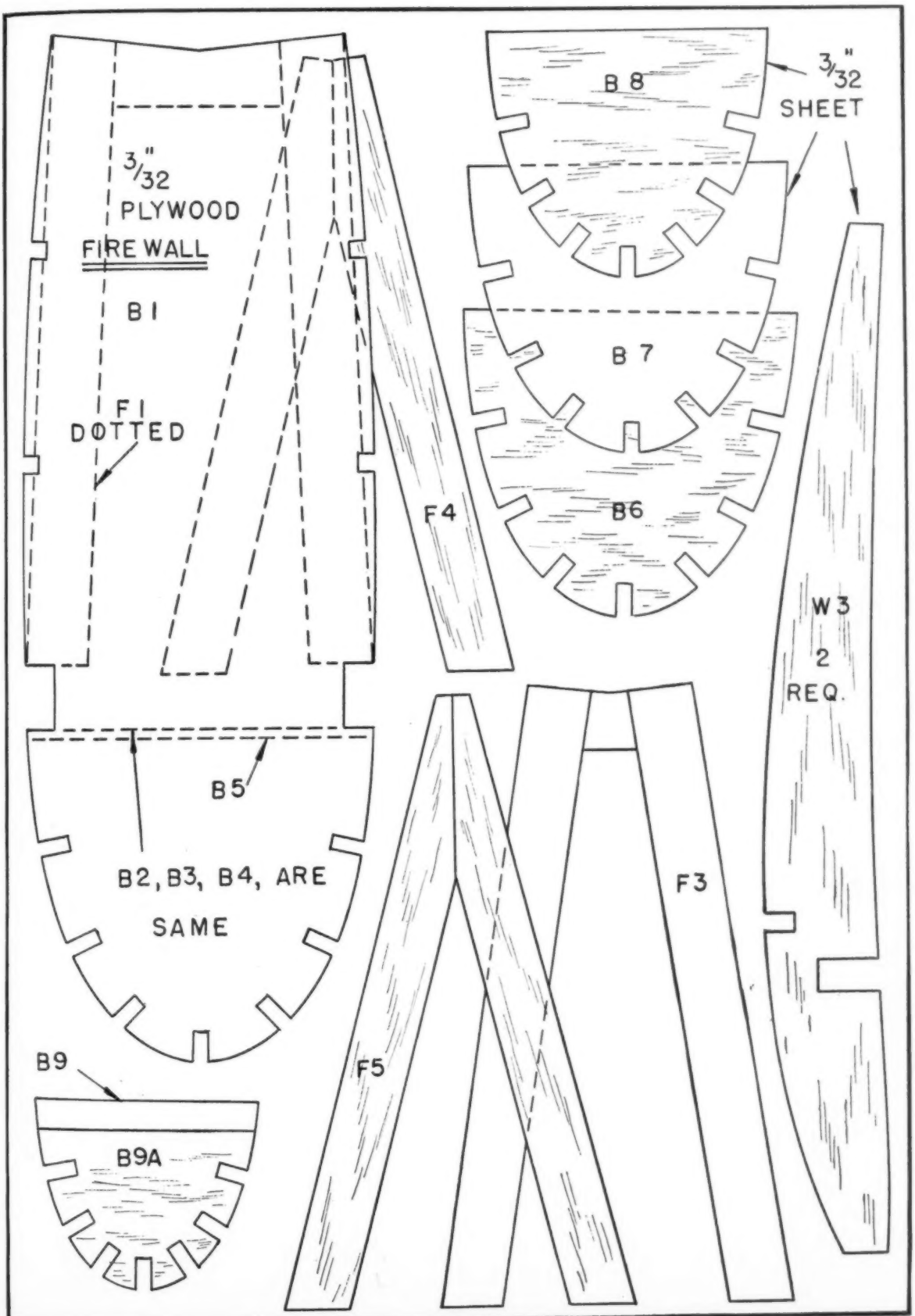
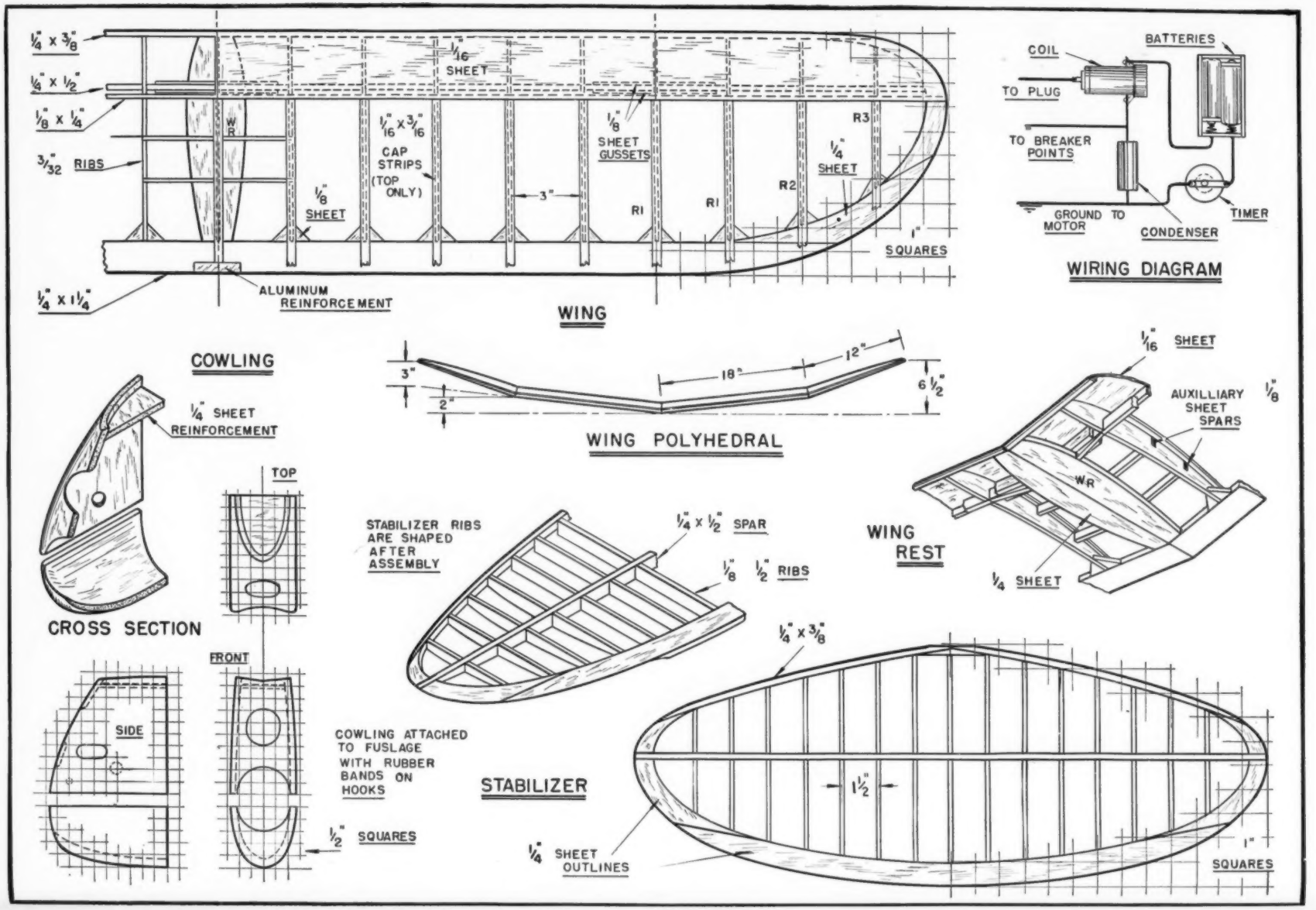
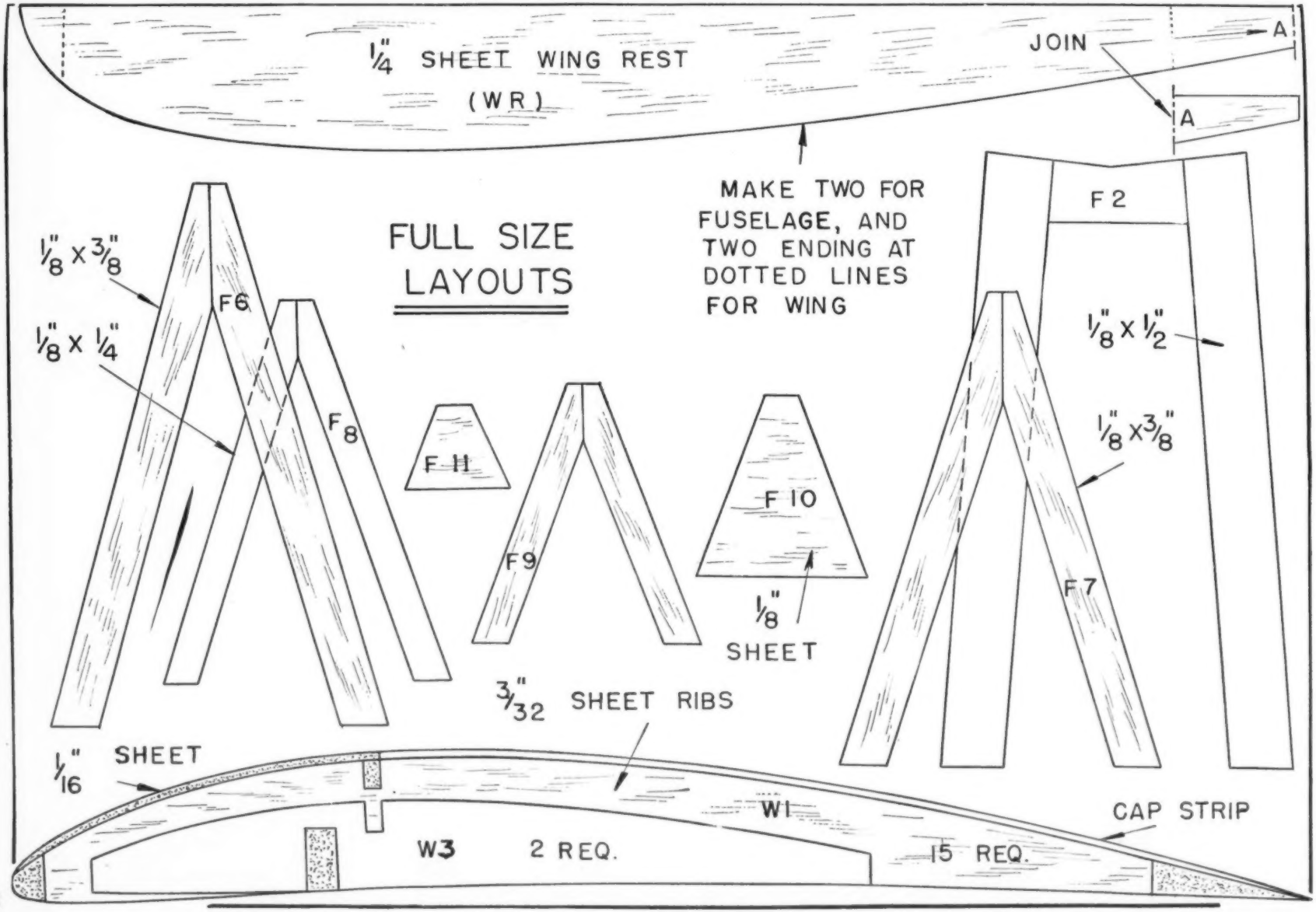

FUSELAGE VIEWS
TOTAL WIDTH MEASUREMENTS
BASSWOOD MOUNTS
TIMER
SIDE
NOTE: 3 SQUARES = 2"
"COMET 35" ENGINE
COIL MOUNTED IN 1/8 SHEET BOX
1/4" SQUARE
1/8" SHEET FILLED IN BETWEEN FORMERS
1/4" SHEET OUTLINES
1/8" SQ.
"CRUTCH" 1/4" x 1/2"
STRINGER POSITIONS
1/8" x 1/4"
.040 WIRE HOOK
1/8" DOWEL
1/8" SHEET
FILL IN 3/16" SHEET
SCALE 3/16" = 1"
BATTERY BOX DETAIL
.034 WIRE SPRINGS
BRASS PLATE ACROSS BOTTOM
NOSE DETAIL
3/16" SQ. COWL GUIDES
5/16" x 1/2" GROOVED BASSWOOD
RUDDER DETAIL
1/16" WIRE PIVOT
3/32" ALUMINUM TUBING
.016 ALUMINUM
REMOVABLE HARDWOOD PEG HOLDS RUDDER IN
1/4" x 1/2" BALSA
1/8" x 1/4"
3/32" SHEET BALSA
1/8" PLYWOOD
1/4" x 1/2" GUMWOOD
"CRUTCH"
BALSA
GUMWOOD
LANDING GEAR
3/32" STEEL WIRE
FUSELAGE CONSTRUCTION DETAILS
THE CLASS "C"
"PACER"
DESIGNED & BUILT BY
SAL TAIBI
DRAWN BY Jack Minassian


3/32" PLYWOOD
FIRE WALL
B1
F1 DOTTED
B8
3/32" SHEET
B7
B6
F4
W3
2
REQ.
B5
B2, B3, B4, ARE SAME
F3
F5
B9
B9A


1/4" x 3/8"
1/4" x 1/2"
1/8" x 1/4"
3/32" RIBS
1/16" SHEET
1/16" x 3/16" CAP STRIPS (TOP ONLY)
1/8" SHEET
1/8" SHEET GUSSETS
1/4" SHEET
R3
R2
R1
R1
W R
3"
1" SQUARES
1/4" x 1 1/4"
ALUMINUM REINFORCEMENT
WING
COIL
BATTERIES
TO PLUG
TO BREAKER POINTS
GROUND TO MOTOR
CONDENSER
TIMER
WIRING DIAGRAM
COWLING
1/4" SHEET REINFORCEMENT
TOP
FRONT
SIDE
CROSS SECTION
COWLING ATTACHED TO FUSLAGE WITH RUBBER BANDS ON HOOKS
1/2" SQUARES
3"
2"
18"
12"
6 1/2"
WING POLYHEDRAL
STABILIZER RIBS ARE SHAPED AFTER ASSEMBLY
1/4" x 1/2" SPAR
1/8" 1/2" RIBS
STABILIZER
1/4" SHEET OUTLINES
1/4" x 3/8"
1 1/2"
1" SQUARES
1/16" SHEET
AUXILLIARY SHEET SPARS
1/8"
W R
WING REST
1/4 SHEET


1/4 SHEET WING REST
(WR)
JOIN
A
A
MAKE TWO FOR FUSELAGE, AND TWO ENDING AT DOTTED LINES FOR WING
FULL SIZE LAYOUTS
F2
1/8" X 3/8"
F6
1/8" X 1/4"
F8
F11
F9
F10
1/8" SHEET
1/8" X 1/2"
1/8" X 3/8"
F7
3/32" SHEET RIBS
1/16" SHEET
W1
CAP STRIP
W3
2 REQ.
15 REQ.

BOMBER BUSTER

The plane on the cover

by **ROBERT McLARREN**

The Curtiss P-40F, Uncle Sam's 400 m.p.h. pursuit plane

MORE speed, longer range, greater fire power! Those are the dictates of World War II sky battle lessons, lessons that have been learned the hard way through more than two years of blood, fire and hate over the English Channel, above the frozen Russian wastes and across the choking, sandy hell of Northern Africa. And Uncle Sam hasn't learned all of these lessons second-hand, either! He's gotten this information from the performance of hundreds of American-designed and built combat planes which have seen a year of service in these torturing regions, have flown and fought thousands of hours, have destroyed scores of enemy planes and many of which have, themselves, come to rest splintered hulks of battered steel and aluminum; victims of their own inadequacy.

Not for long does an American countenance his best efforts falling very far short of the mark. And not for long has the huge Curtiss-Wright Corporation watched idly while its products were overwhelmed in the air due to lack of speed, range or hitting power. More than two thousand Curtiss "Hawk" single seat pursuit planes, in a variety of models, have seen actual service in the air forces of the democracies and the lessons gained from the tremendous flying hour totals run up on these machines have been hard, bitter ones.

The Hawk 75 used by the French Air Force taught the need for more armament. The Hawk 81 "Tomahawk" taught the need for greater range and more speed. And the new "Kittyhawk" will teach many more lessons even while incorporating the answers to earlier demands upon the type. As each of these progressively improved models have winged into battle bearing the red-white-blue cocardes of the democracies a similar model has gone into service with the United States Army Air Forces, slightly different to be sure, slightly better, slightly superior. The latest and best has always belonged to America, the ships going to Europe only after Uncle Sam has received a newer one. The P-36 air-cooled variety was being mustered out of the Army as it was being shipped to France; the P-40 was rapidly being replaced when the Tomahawks first rose from the Libyan deserts. And now the new P-40D's are due to be replaced and sent to England as the Kittyhawk.

More than two years ago we played host at the announcement party for the brand new Curtiss P-40 pursuit (MODEL AIRPLANE NEWS, February, 1939 issue) and the ink was hardly dry on that issue before Curtiss, Allison and the Army Air Forces had begun to work miracles with improvements through re-design. The radiator cluster was moved forward under the nose, the ejector type exhausts were abandoned in favor of the short stack type, the carburetor air inlet had been moved forward to the nose, the landing gear cover-plates had been altered and the armament vastly improved. Through the P-40A, B and C models the Army flew, serviced and flew these ships. Then came the P-40D, a vast improvement over the earlier models with a slimmer fuselage, revised cockpit enclosure, retractable tail wheel and re-designed radiator housing under the nose.

Power was increased and fire-power augmented twenty-five per cent. Speed was improved considerably but even this hasn't slowed the work of research staffs of these three partners in the project. The P-40E (production model of the P-40D with minor improvements) has been re-designed to accommodate the new American-built Rolls-Royce Merlin engine. Then came this ship, the P-40F, latest in the series; but it will be only a matter of weeks before the new XP-46 makes its appearance, a newer, faster, more powerful model.

This powerful series is now the standard single seat pursuit ship of the U. S. Army Air Forces Combat Command and is an all-metal single engine monoplane built around a liquid-cooled engine. It features fully enclosed single seat cabin and fully

(Continued on page 49)

ACADEMY OF MODEL AERONAUTICS

(A Division of the National Aeronautic Association)

Official Model Airplane News

A NOVEL idea for wintertime competition has been suggested by C. L. Bristol of Cheyenne, Wyo., A.M.A. State Councillor for that state. Mr. Bristol suggests:

"As a means of keeping up interest during a dull season, I've doped out a quick-start contest which we will try at our regular meeting, January 17. The boys will bring their ships, with or without wings, and other paraphernalia to the meeting. The idea is to see who can hook up his booster batteries, start his cold motor, and maintain a 5-second run in the least over-all time. Prizes for first, second, and third place. No helper, no practicing, and no chiseling!

"I think you ought to carry a yarn which will provide all clubs with some much-needed information, namely how to execute a deft and effective approach when dealing with local newspapers. My observation has been that a great many clubs manage to 'queer themselves' with their papers and they lose heavily thereby."

Occasionally we run across a person engaged in full-scale aviation activity who is also a model fan. One such individual is Virgil W. Russell, who operates a flying school at Jonesboro, Ark. When applying recently at A.M.A. Headquarters for model sporting license Mr. Russell commented:

"We have a good deal of model flying here in Jonesboro, but do not have a club. I own and operate a primary flying school in Jonesboro, Ark., and one in Blytheville, Ark.

"At present I have five Aeronca T L 65 HP Trainers and have turned out one hundred and five Private Pilots for C.P.T. I have been flying for seventeen years, am a Rerated flight instructor and Commercial Pilot, also airplane mechanic.

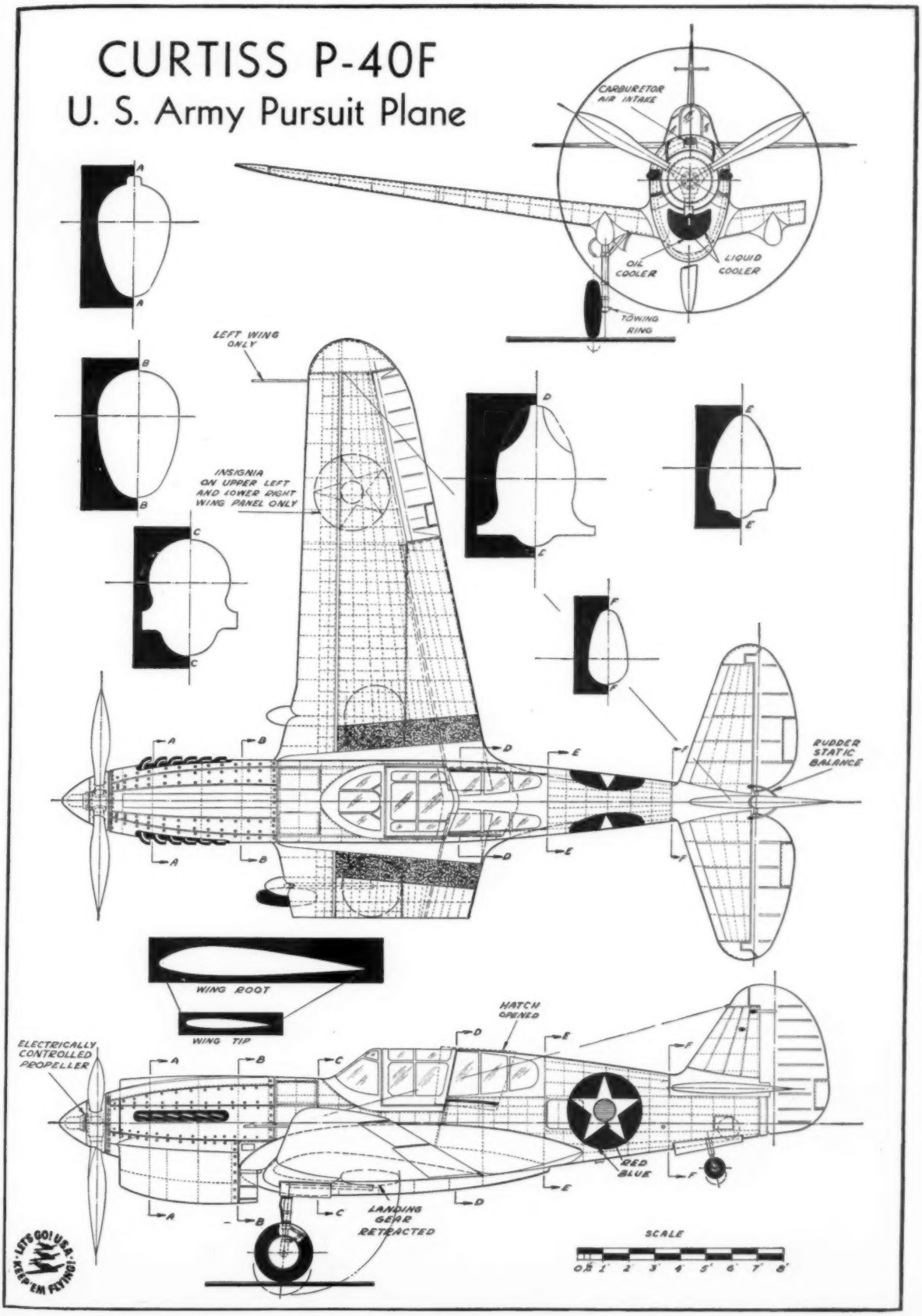
"If it is at all possible I would like to have my gas license the same as my pilot's license (5101) or as my mechanic license (5502)."

There are New Year's resolutions and New Year's resolutions, but one of the

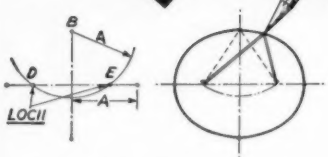
(Continued on page 40)

CURTISS P-40F

U. S. Army Pursuit Plane

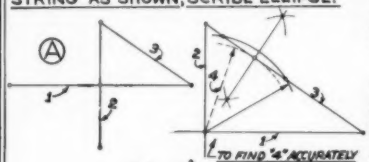


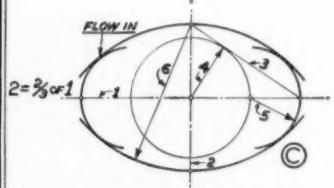
TRICKS of the TRADE



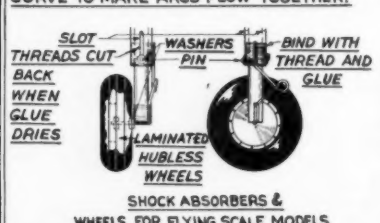
ELLIPSE CONSTRUCTIONS

USING ½ MAJOR AXIS "A" AS RADIUS DRAW ARC FROM POINT "B". PLACE THUMB TACKS OR PINS AT POINTS "D & E." WITH PENCIL AND STRING AS SHOWN, SCRIBE ELLIPSE.



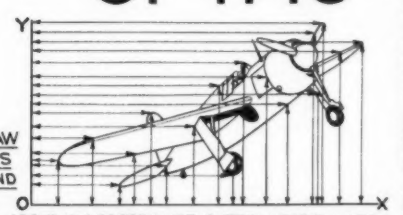


APPROXIMATE ELLIPSE WITH WIDTH EQUAL TO 2/3 OF LENGTH — MADE WITH ARCS. STEPS ARE NUMBERED. ½ OF "2" ADDED TO "2" EQUALS "1." DIAGONAL "3" DETERMINES RAD. "4" WHICH LOCATES THE CENTER OF ARC "5." ARC "6" FORMS LONG SIDES. USE A FRENCH CURVE TO MAKE ARCS FLOW TOGETHER.



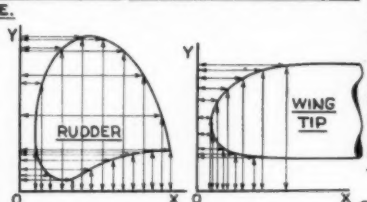
SHOCK ABSORBERS & WHEELS FOR FLYING SCALE MODELS

FORK TYPE, WHEEL ALIGNING GUIDE FOR SCALE MODELS SLIGHTLY REDESIGNED MAKES AN EXCELLENT SHOCK ABSORBER. THE USUAL COIL SPRING IS TOO DIFFICULT TO INSTALL ON SMALL MODELS. THE TORSION SPRING SHOWN IS GLUED AND BOUND WITH THREAD TO A BALSA DOWL LOWER STRUT, FITTED TO SLIDE EASILY WITHIN AN ALUMINUM TUBE, AND TO THE TUBE ITSELF. THIS TYPE SHOCK ABSORBER MAKES POSSIBLE EASY LEVELING OF MODEL (BENDING LOOP WITH PLIERS TO MAKE EACH LANDING GEAR LEG THE CORRECT LENGTH TO MAKE THE WING TIPS LEVEL). WHEN THE WHEEL IS IN THE EXTENDED POSITION A STRUT ALIGNMENT PIN IS PUSHED THROUGH THE DOWL HOLE AT THE BOTTOM OF THE SLOT IN THE TUBE. LIGHT PIANO WIRE SHOULD BE USED FOR THE SPRING. NO. 6 OR LESS, BENT WITH ROUND NOSED PLIERS, WILL DO FOR THE AVERAGE MODEL.



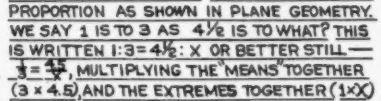
ABOVE IS A COORDINATE SYSTEM FOR ENLARGING PICTURES OR CURVED PARTS ON DRAWINGS.

EVEN A COMPLETE DRAWING MAY BE TREATED IN THE SAME WAY. THIS SYSTEM IS HIGHLY ACCURATE AND IS FAR BETTER THAN THE SQUARING METHOD USUALLY USED. ANY POINT ON THE DRAWING IS A CERTAIN DISTANCE (MEASURED WITH RULER OR DIVIDERS) DOWN TO THE HORIZONTAL LINE, AND OVER TO THE VERTICAL LINE.

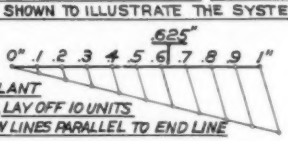


THE COORDINATE SYSTEM IS SIMPLE FOR ENLARGING OR REDUCING CURVED PARTS. FOR ENLARGING A DRAWING ONE, TWO, OR MORE TIMES, DIVIDERS ARE FINE. FOR FRACTIONAL INCREASES, OR REDUCTIONS, PROPORTIONAL DIVIDERS ARE ALMOST INDISPENSABLE. BELOW A PAIR IS SHOWN——

IF THUMB SCREW IS SET AT TWO, A=2B FOR REDUCTIONS, AND B=½A FOR ENLARGING DRAWINGS



IF NO OTHER MEANS ARE AVAILABLE, AND YOU ARE WILLING TO SPEND THE TIME, ENLARGE OR REDUCE YOUR DRAWING USING A RULER AND MATHEMATICS. LETS TAKE A SIMPLE PROBLEM. YOU'RE ENLARGING THE DRAWING 3 TIMES. THE MEASUREMENT TO BE ENLARGED IS 4½". NEXT WE SET UP A PROPORTION AS SHOWN IN PLANE GEOMETRY. WE SAY 1 IS TO 3 AS 4½ IS TO WHAT? THIS IS WRITTEN 1:3=4½:X OR BETTER STILL— $\frac{1}{3}=\frac{4.5}{X}$, MULTIPLYING THE "MEANS" TOGETHER (3 × 4.5), AND THE EXTREMES TOGETHER (1×X) AND SETTING THEM EQUAL TO EACH OTHER, WE GET X=13.5". 4½" ENLARGED 3 TIMES IS OBVIOUSLY 13.5". IN MORE DIFFICULT PROBLEMS HOWEVER, YOU MUST USE PROPORTIONS. DOING THIS PROBLEM ON THE SLIDE RULE IS EASIER THAN ANY OTHER. TAKING THE SAME PROBLEM, LOCATE 1 ON THE "C" SCALE DIRECTLY ABOVE 3 ON THE "D" SCALE. IF 4.5 IS LOCATED NOW ON THE "C" SCALE, 13.5 WILL BE UNDERNEATH IT ON THE "D" SCALE, LEAVING THE "SLIPSTICK" SET WITH 1 ABOVE 3. ANY MEASUREMENT TAKEN FROM YOUR DRAWING AND READ ON THE UPPER SCALE "C" WILL BE 3 TIMES LARGER ON THE "D" SCALE DIRECTLY UNDERNEATH. THERE IS NO WORK AT ALL TO THAT; JUST READ OFF THE ANSWERS. CHANGE YOUR FRACTIONS TO DECIMALS, HOWEVER, BEFORE TRYING TO FIND THEM ON A SLIDE RULE. IF THE DRAWING IS VERY LARGE, INSTEAD OF USING THE "L" TYPE BASE LINES SHOWN, USE A CROSS IN THE MIDDLE OF THE DRAWING, MEASURING OUT FROM IT IN ALL DIRECTIONS. ALL THE MEASURING LINES SHOWN DO NOT HAVE TO BE MADE ON THE DRAWING. THESE WERE ONLY SHOWN TO ILLUSTRATE THE SYSTEM.



ON SLANT LINE, LAY OFF 10 UNITS. DRAW LINES PARALLEL TO END LINE

IF YOU HAVEN'T A RULER READING IN 10THS OF AN INCH, MAKE YOUR OWN USING ANY PIECE OF PAPER, AND THE SLANT LINE METHOD OF PLANE GEOMETRY, COMMONLY USED IN AIRFOIL LAYOUT. IF MEASUREMENT IS 3.625", MARK OFF 3" WITH AN ORDINARY RULER. THEN USING THE PIECE OF PAPER WITH 1" DIVIDED INTO 10THS, ADD .6" TO 3" PLUS ⅝ OF .1" (.625" IS SHOWN ON THE SCALE ABOVE).

WHEN INKING, FILL YOUR RULING PEN WITH AN EYE DROPPER. IT IS FAR BETTER THAN THE USUAL TYPE SHOWN ABOVE. SQUEEZE THE EYE DROPPER JUST ENOUGH TO EMIT A SINGLE DROP OF INK. SOME INK COMES IN BOTTLES WITH AN EYE DROPPER TOP. A SIMPLE AND EFFICIENT SUBSTITUTE IS A FIVE CENT EYE DROPPER. THEY CAN BE INEXPENSIVELY REPLACED WHEN AIR LEAKS THROUGH THE RUBBER TOP. TO CLEAN THE PEN WHEN IT GETS CLOGGED HAVE A SCRAP PIECE OF PAPER HANDY WITH ONE OR TWO CORNERS FOLDED UP. SLIDE THE CORNER POINT OF THE PAPER THROUGH YOUR PEN. THE INK, BEING ON THE VERTICAL CORNER OF THE PAPER, WILL NOT RUIN YOUR DRAWING OR DRAFTING BOARD BEFORE IT DRIES. DRAFTING TECHNIQUES AND HINTS GO HAND IN HAND WITH ENGINEERING AND EXPERT MODEL BUILDING, — AND OF COURSE ALL OF YOU WISH TO BE EXPERT MODEL BUILDERS. SHORT CUTS AND IMPROVED METHODS ARE IN USE EVERYWHERE. DON'T FAIL TO NOTICE THEM! YOU'LL BE "TRICKS" AHEAD OF YOUR FELLOW MODEL BUILDERS.

Robert Lloyd Brown

BUILD AND FLY THE MILES MAGISTER

A low-wing scale model with superior flying qualities

by **EARL STAHL**

EQUALLY important to a nation at war as the actual production of war planes is the training of crews to operate and maintain them. Throughout the British Empire a pilot force and other aviation specialists are being trained to sinew the air arm for the knockout blow against the Axis.

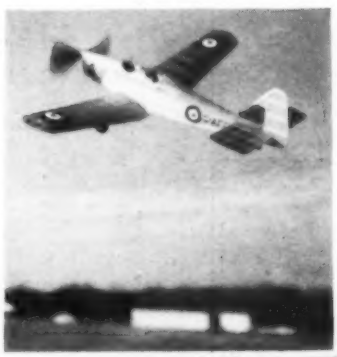
Many Royal Air Force cadets are now receiving their initial flying in Miles "Magister" trainers, our subject for this month's flying scale model. Strikingly similar to planes now being used by our own Army Air Corps, notably the Fairchild PT-19, the "Magister" has been engineered for the required trainer qualities of stability and strength.

Structurally the Miles Magister is all wood, following a practice popular in England for some years. The fuselage is a box structure of spruce with plywood stressed covering. Wings are in three sections, also plywood covered, and can be folded to conserve space. Instructor and student are seated in tandem; open cockpits each with a full set of instruments.

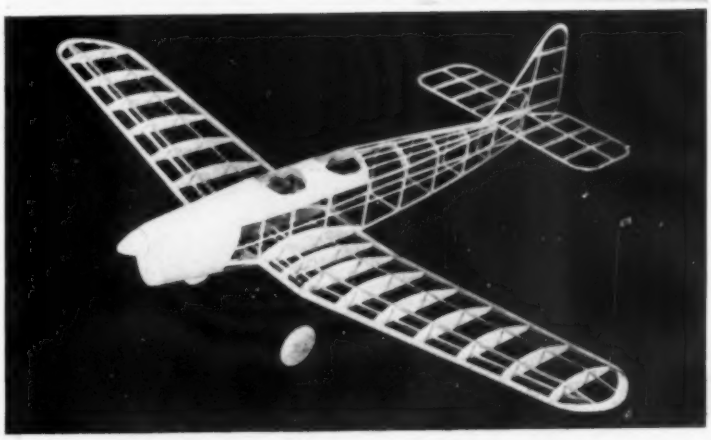
Power from a 130 hp. de Haviland Gypsy inverted, air-cooled engine gives maximum speed of 145 m.p.h.; cruising speed of 125 m.p.h. and with flaps extended lands at 45. This trainer climbs 1,200 ft. per min. to a service ceiling of 18,000 ft. Normal range is 400 miles.

A model Miles Magister is interesting to build and fly. Extreme structural simplicity and efficient aerodynamic design combine to produce a low-wing model with flight capacity comparable to many high-wings, flying steadily with plenty of power and the appearance of a full size plane.

Before actual construction of the model, study the plans carefully to become familiar with the details. With a clear picture of each detail in mind, gather all necessary material and begin.



Realistic and graceful in flight as well as design, with neat super-light construction



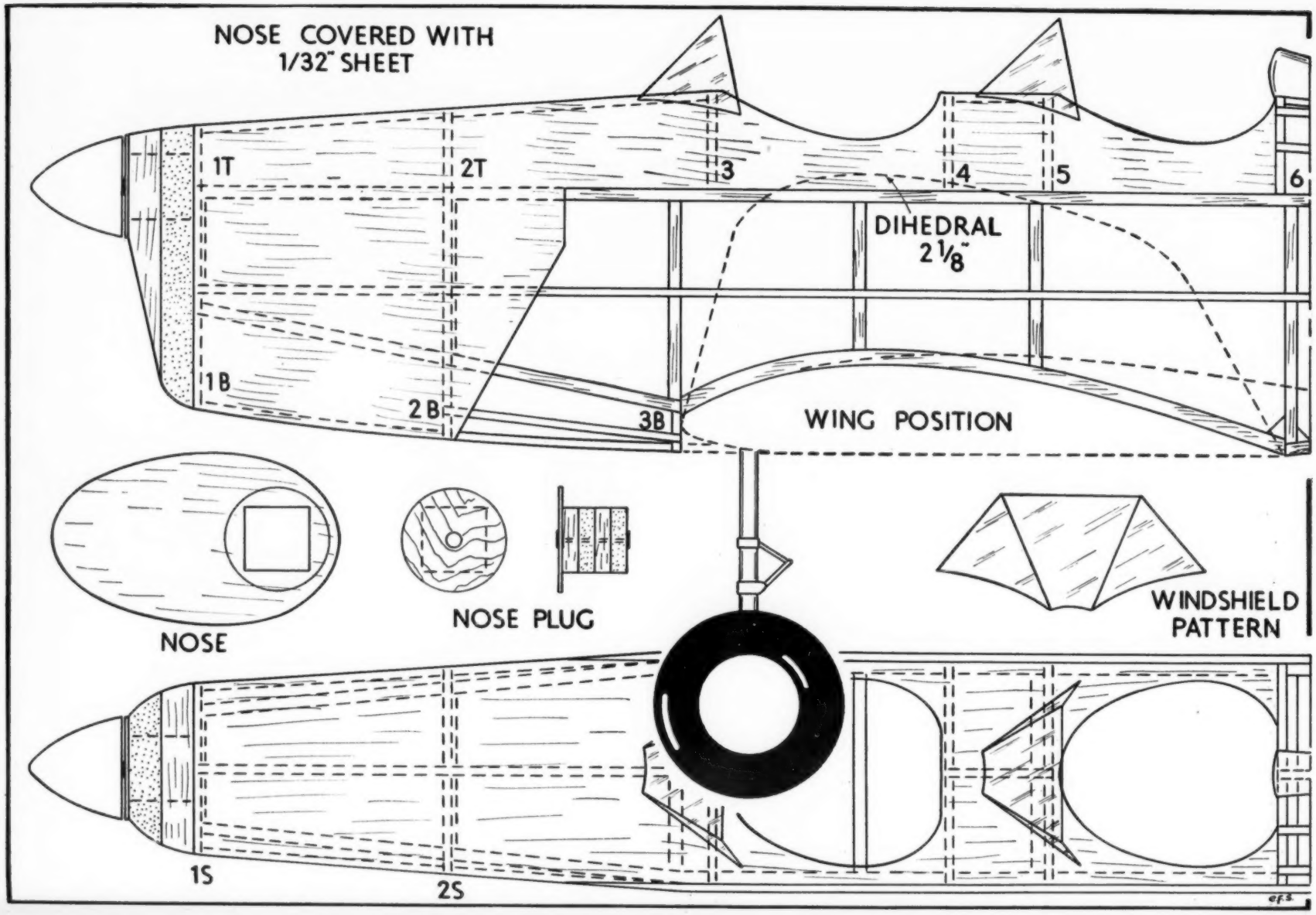
Fuselage

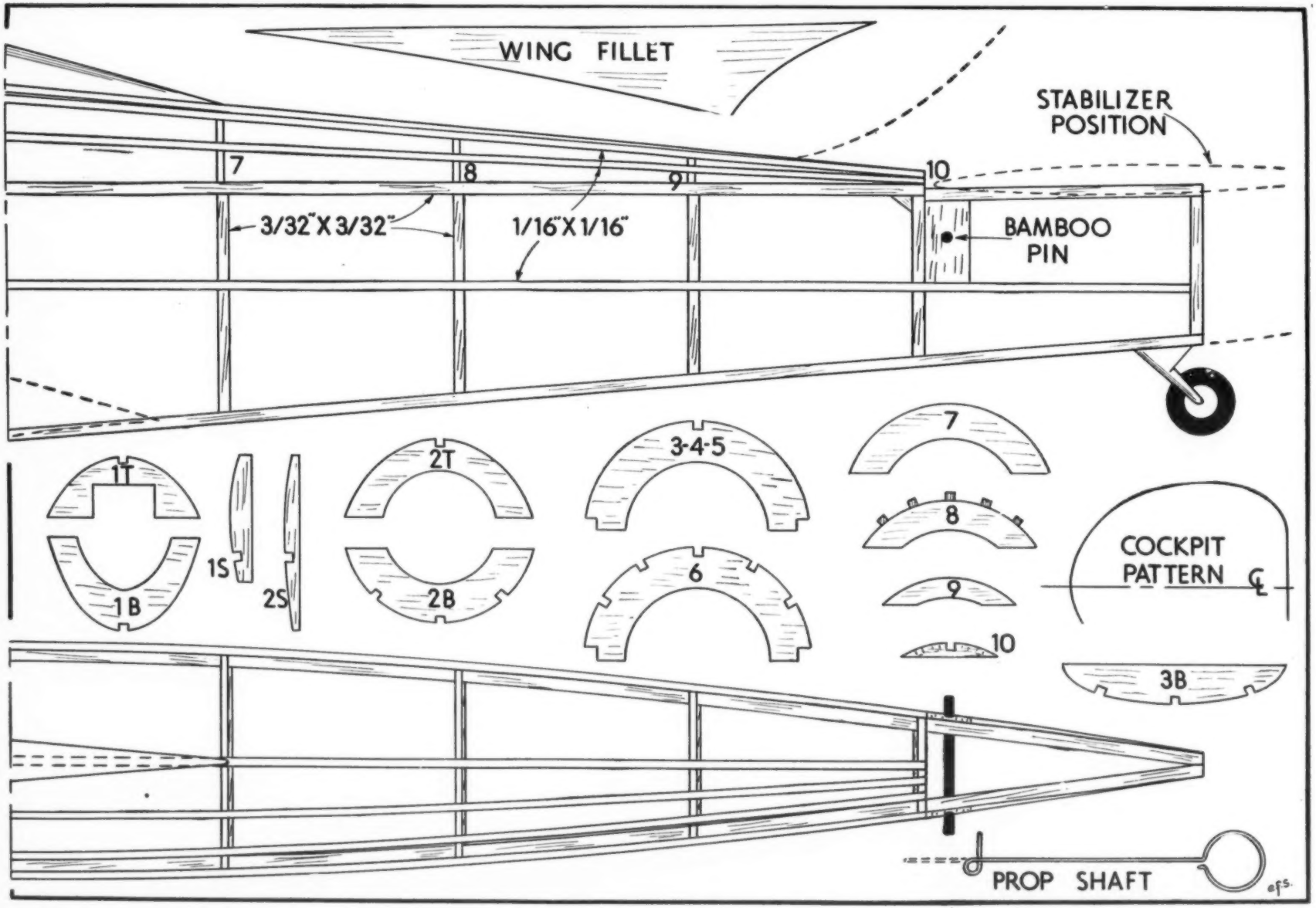
The fuselage underframe is constructed first, shown lightly shaded on the plan. Work directly over the magazine pages and make two side frames, one atop the other. Longerons and uprights are 3/32" sq. balsa. When dry, the side frames are inverted over the top view of the fuselage and the 3/32" sq. cross-pieces cemented to place. Check frequently for alignment.

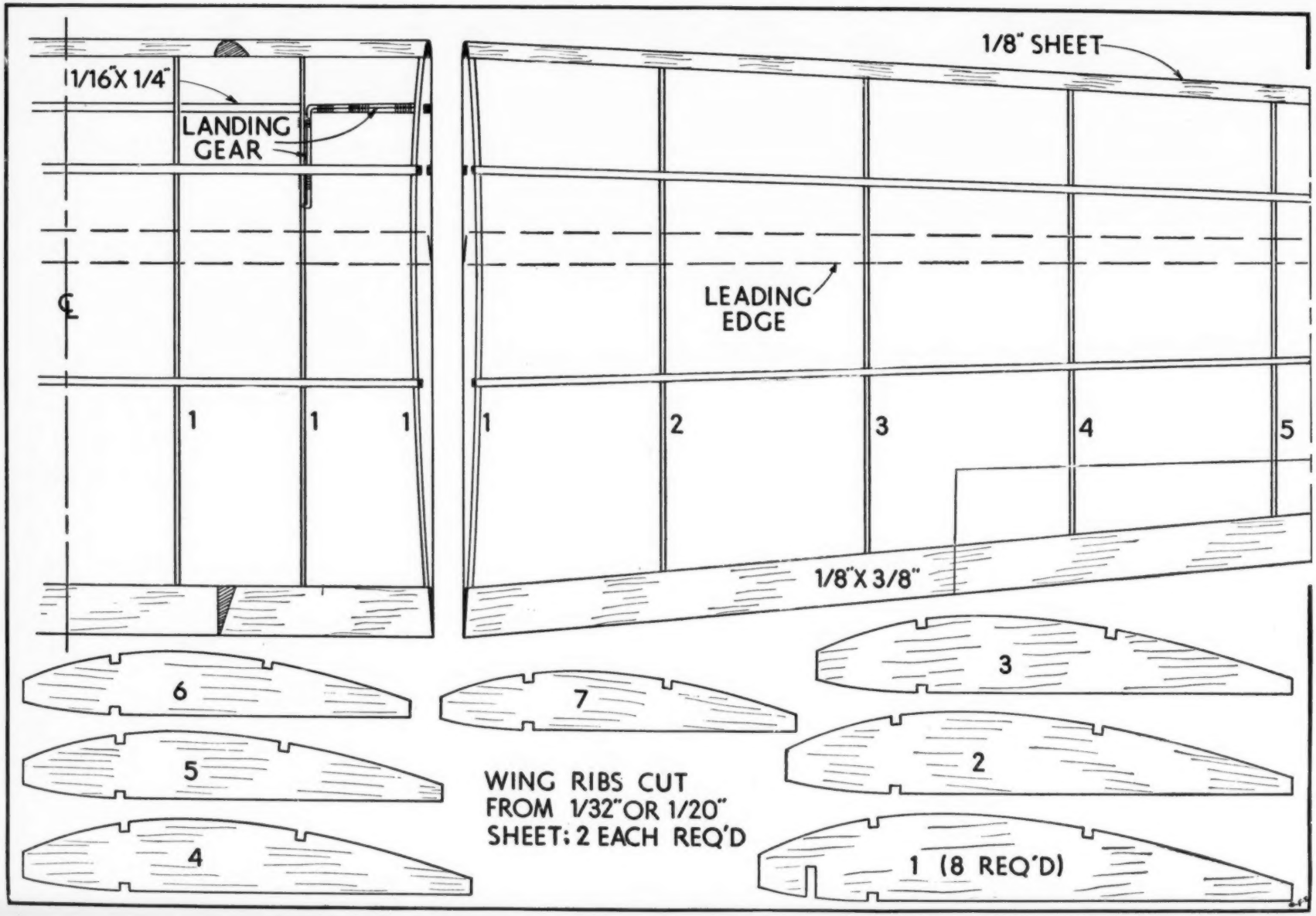
Formers are cut from medium grade 1/16" sheet balsa. Notice that several formers do not have notches for the stringers and where this is true, the stringers are attached directly to the sides, as shown. Cement the formers to the positions indicated and then add the 1/16" sq. stringers. Stringers which run back the sides are attached directly to the underframe. Because of high thrust line, remove the middle section of the 3/32" sq. cross-pieces, once the top formers are in place, to prevent interference with the rubber motor.

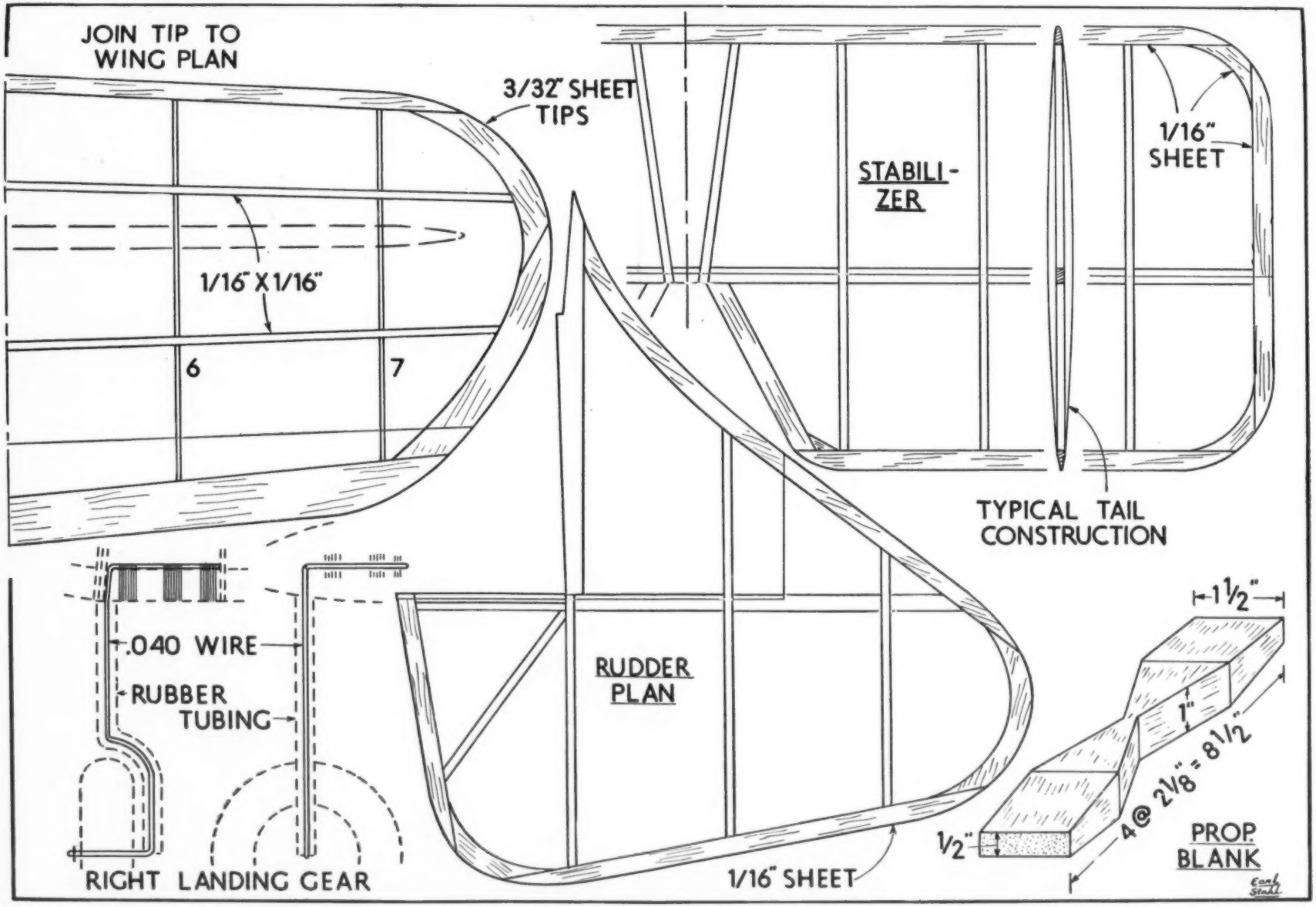
The shaded area of the nose is covered with soft 1/32" sheet balsa. Use the widest stock available and cement the covering to the entire adjacent frame. Pins and rubber bands are helpful to hold the sheet in place until dry. The top section from No. 3 to No. 6 is covered also. Cut this piece to fit accurately, then cut out the cockpits; a pattern indicating the shape is given. Cement to place as with the nose covering.

(Continued on page 46)


NOSE COVERED WITH
1/32" SHEET
1T
2T
3
4
5
6
DIHEDRAL
2 1/8"
1B
2B
3B
WING POSITION
NOSE
NOSE PLUG
WINDSHIELD
PATTERN
1S
2S


WING FILLET
STABILIZER POSITION
7
8
9
10
3/32"X3/32"
1/16"X1/16"
BAMBOO PIN
1T
1B
1S
2S
2T
2B
3-4-5
6
7
8
9
10
COCKPIT PATTERN
3B
PROP SHAFT
afs.


1/8" SHEET
1/16"X 1/4"
LANDING GEAR
LEADING EDGE
1/8"X 3/8"
1
1
1
1
2
3
4
5
6
7
3
2
5
4
1 (8 REQ'D)
WING RIBS CUT FROM 1/32" OR 1/20" SHEET; 2 EACH REQ'D


JOIN TIP TO WING PLAN
3/32" SHEET TIPS
1/16" X 1/16"
6
7
STABILI-ZER
1/16" SHEET
TYPICAL TAIL CONSTRUCTION
.040 WIRE
RUBBER TUBING
RIGHT LANDING GEAR
RUDDER PLAN
1/16" SHEET
1 1/2"
1"
4 @ 2 1/8" = 8 1/2"
1/2"
PROP BLANK

2. The "Bee" built by Edward Bland from plans in MODEL AIRPLANE NEWS: weight 25 ounces

3. A 52 inch parasol gas job by Francis Williams

4. A Luscombe "50" scale gas model built by Walter Suchma

5. Bob Abbett's first gas model that won its first contest

6. A beautifully modeled 30" Lockheed Lodestar by F. W. Neidinger

AIR WAYS

1. Bill Salmson tests his slotted wing retractable wheeler

News of models and builders from all parts of the world

THE origin of model aviation may be obscure to present day model builders, not speaking of Leonardo Da Vinci or the early pioneers, but rather of that group to become active since Wrights' first flight.

Keen interest in aviation at that time spurred the imagination and activity of scientific thinkers; their inventive genius under the stimulus, sought concrete expression and followed the path of least resistance. Thus model building on an active scale became popular.

Through the years until the first World War it grew to considerable proportions, attracting only those of scientific mind and who followed this hobby for only scientific and educational rewards. As the art became greater in scope and hundreds were attracted to participate in this great sport, awards were more extensively and generously given.

This trend has finally reached the stage where many model builders are focusing their attention upon the award rather than on the knowledge they receive from participation in the activity. Now apparently there are two general groups of model builders: Those kindred to the originators of this sport, of scientific inclination, urged by the desire to learn, and a second group who are primarily sportsmen. The latter's interest gravitates chiefly to building and flying models already designed. The thrill of action and actually flying planes is the basis for their participation, plus the competition for some contest award.

This division with two primary sources of interest must now be recognized, for the rules at present favor only the sporting group and not the scientists, encouraging the use of already designed models and not the creation of new designs. Designers are handicapped when competing with the model sportsmen; flying planes which are not fully developed but which embody important and interesting new ideas in competition.

This condition threatens the game; the spark which created and kept model aviation alive, namely the possibility for experiments. Now, models of only one basic type are being flown in contests because they have proved, under the present rules setup, to be superior to others.

It is necessary for the leaders to take remedial action, to note the primary objective that created model aviation and upon which its future continuance and success depends.

We hope that all leaders and the Academy of Model Aeronautics will give serious thought to establishing an event or events (not to the exclusion of present events, but supplementary) to provide competition for model *scientists.* To encourage this we suggest that these supplementary events include only models of original design.

Next month some extremely interesting news concerning this matter will be published here.

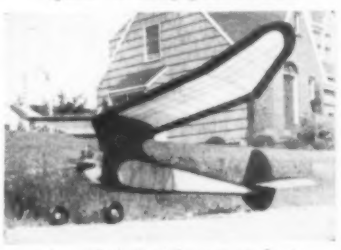
News of interest has come from a number of readers. In picture 1 Bill Salmson is in the act of glide-testing his model of unique design. Many model builders, to eliminate head resistances, have resorted to merely one wheel. Salmson goes still further; his one wheel retracts into the

(Continued on page 28)

7. F. C. Oertle and Atom powered model that flew for 40 min.

8. Bakersfield Marathon Contest winners: Chas. Allen, Joe Menezes, Vernon Oldershaw

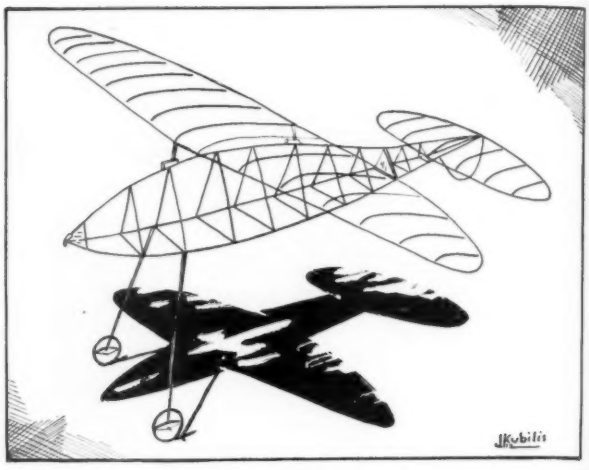
9. Robert Porter, Philip D'Ostilio and Wm. Wargo, participants in Bridgeport contest.



10. Ted Enticknap's 8 foot parasol that still flies after 100 flights

11. Walter Coburn Jr. with his original design model that won Craftsmanship Event

A Record Indoor Fuselage Model



Start the indoor contest season by building this class B record breaker

by **G. BELSKY**

TSK, tsk, what luck. Fancy that! Etcetera. These were some of the remarks overheard while a little fuse aircraft was gaily frisking among the girders and other hazards that comprise an airdock. The time the model was remaining in the air was not the cause of the comments; it was the nature and course of the flight. During that epoch-making flight this "crock" came in contact with the roof and girders exactly twenty-nine times without catching once. This ought to be a record itself, considering that the roof was approximately 120 feet up. The truth of the matter is that this crock was transported to the "Nats" merely to have something to fly; we were as much, if not more, surprised than the spectators when the model established a record. We were quite abashed when on its first flight the crate began to thrash about the girders with 200 turns. For the second official flight the motor was wound 1350 turns: A flight of 9:20 resulted.

On the third official the model was sent aloft with 1500 turns. After a heated argument with the rafters, the model descended about halfway then it decided to sever relationship with the empenmage. The motor however, acting diplomatically, tended to keep the parts together. The net sum was that the model descended quite rapidly. Nevertheless the time was 12:25, sufficient to place fourth.

It was then and there that we acquired the brilliant idea to wind it up more to gain greater duration. (???) Purely theoretical. Henceforth, a record trial was declared and the model was heaved into the air to fall we knew not where. With 1600 turns the model gained altitude rapidly; within three minutes it had reached its maximum altitude (the roof). During the next six minutes it was energetically attempting to dislodge all obstacles, including the roof; on this flight the crate hit twenty-nine times. Again, after descending about midway, the tail assembly embraced the wing and thus the model fluttered down with a velocity inversely proportional to Goldberg's gasbuggy climb.

Construction

Fuselage: The triangular fuselage affords many advantages; the outstanding being lighter construction. Tests revealed the model glided much better with said fuselage when compared with a diamond type. The result may be due to the "surf board" action at positive angle of attack. This bears experimentation.

The fuselage underside is constructed first. The front center and rear triangular uprights are cemented to the bottom first, and upon these the top longeron is placed. The other uprights are then placed. The longerons are 3/64" sq. of about 5/lb/cu. ft. density. The uprights are of same balsa, but are 1/32" sq. The fuselage is braced with hair. Note that the bracing is to oppose torque. Front and rear is cross-braced to facilitate handling. Care must be exercised in bracing fuselage to prevent twisting of unit.

The fuselage is covered with green (if possible) microfilm; the first and last sections are double covered. The wing clip lugs are then cemented on and that's that.

Tail Assembly

Boom: The boom is of the built up va-

(Continued on page 43)

The American Model Builder Is Discovered

by **THE INSTRUCTOR**

YOU'LL never be able to accuse the Instructor of provincial-mindedness, for he does get around. During the past two years he figures he has covered 40,000 miles going to meets, model conferences and aeromodeling shindigs in general. All of this entitles him to a new pair of shoes and qualifies him to make a few pertinent observations concerning model building in the East versus model building in the West, and the Southern attitude toward the hobby as compared to the outlook our Northern friends have developed.

In his travels around the country, the Instructor has been particularly interested in discovering that American aeromodelers are more or less alike in their desire to build better models that will fly farther than anybody else's.

It is encouraging to observe the tremendous interest in model aviation that has developed in every little town as well as the larger metropolitan areas. It is satisfying to know that you can find model hobby shops and aeromodeling paraphernalia and publications almost anywhere in the country. It's quite a thrill to purchase a copy of M.A.N. in the Pan American Airways Dinner Key, Florida base and afterwards see the same issue in a corner drug store in San Francisco or Chicago.

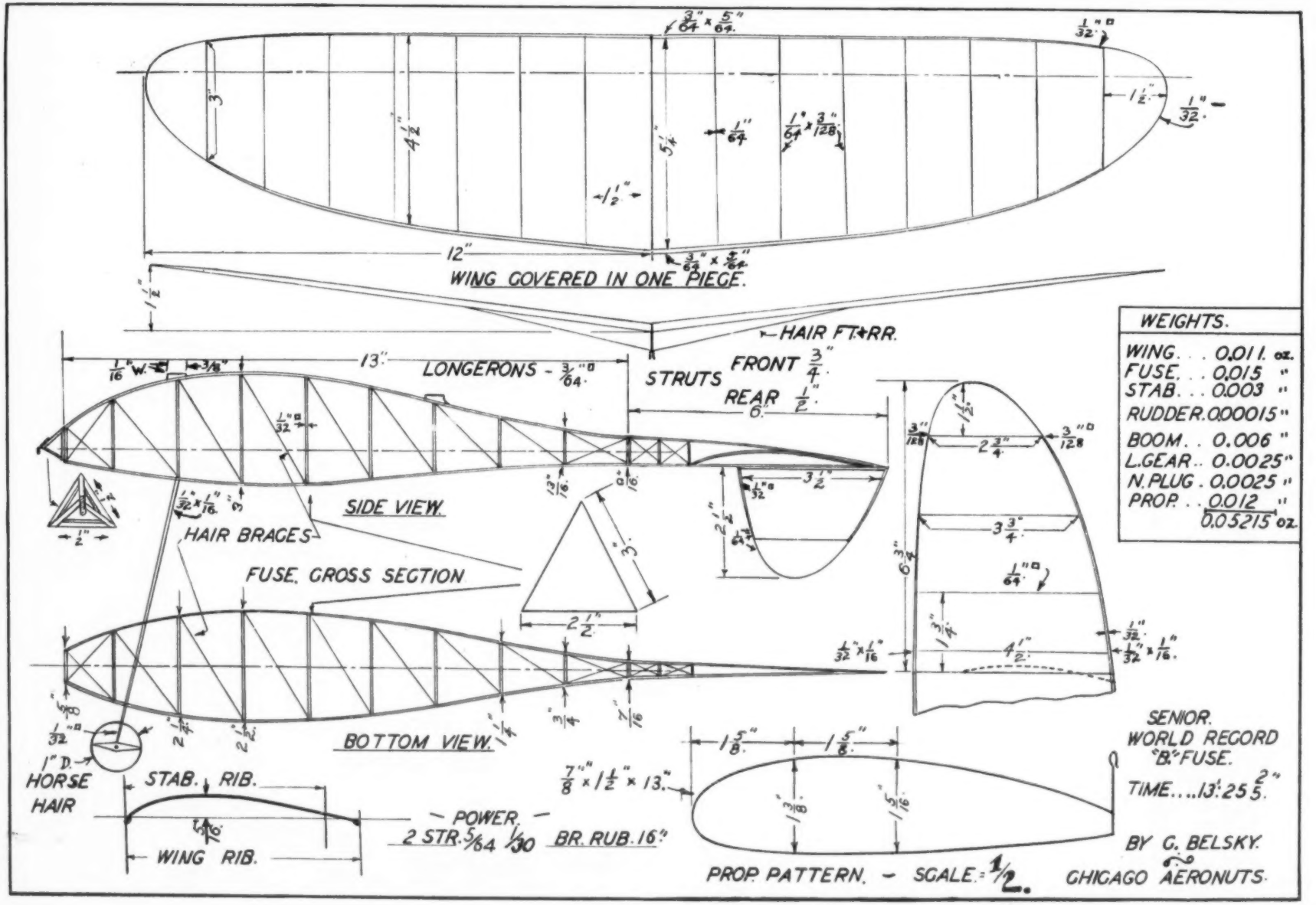
Model aviation is more advanced today than ever due to the trend of world events which has focused attention on aviation and on the youth of the nation. Then, too, youth *and* aviation are a "natural" combination that is unbeatable. Yet, despite all the present opportunities for aeromodelers to secure sponsorship and an appreciation of their work, too many are missing their chance for recognition because of a lack of appreciation of values. Perhaps it is not as widespread as formerly, but jealousy between clubs and rivalries bordering on the edge of out-and-out battling still prevent many modelers in some metropolitan centers from seeing eye to eye. . . . Such friction means no coordination of effort. . . . No coordination of effort means no advancement of the hobby in the community and no general acceptance on the part of the public of the activity.

The rural areas, because of their comparatively few large-size clubs, have not engaged in this bickering in the same way as some cities. But it is regrettable that there are some organizations which do not realize that in unity there is strength and in strength there is permanence.

The inability of some aeromodelers to work together in their common cause is—on a smaller scale—a duplicate of the national political picture. Obviously we need new ideas, new ways of building models and running meets, just as we need more recognition from the government for the rights of the citizen, but in neither case is it necessary to introduce changes for the better by breaking up existing agencies, which, in the model field, means clubs.

Check up on your own community. Is there more than one model aero club active and growing? Assuming you have two clubs in your vicinity, do they check with each other on contest dates, exchange views,

(Continued on page 35)


WING COVERED IN ONE PIECE.
HAIR FT. & RR.
STRUTS FRONT 3/4".
REAR 1/2".
LONGERONS - 3/64" D
SIDE VIEW.
HAIR BRACES
FUSE. CROSS SECTION
BOTTOM VIEW.
HORSE HAIR
STAB. RIB.
WING RIB.
POWER. 2 STR. 5/64 1/30 BR. RUB. 16"
PROP. PATTERN. - SCALE: 1/2.
WEIGHTS.
WING . . 0.011 oz.
FUSE. . . 0.015 "
STAB. . . 0.003 "
RUDDER. 0.00015"
BOOM. . 0.006 "
L. GEAR . . 0.0025"
N. PLUG . 0.0025 "
PROP. . . 0.012 "
0.05215 oz.
SENIOR.
WORLD RECORD
"B" FUSE.
TIME....13: 25 2/5"
BY C. BELSKY.
CHICAGO AERONUTS.

FLASH-NEWS

Special to MODEL AIRPLANE NEWS

BIGGEST news of the month is of course the treacherous Japanese attack on Hawaii. Next is the coincident deaths of German's four highest ranking military fliers. Colonel-General Ernst Udet, Quartermaster-General of the Luftwaffe, lost his life in a crash, testing a new German fighter plane. In charge of procurement for the German Air Ministry, he was second only to Field Marshal Goering. His job was development and test of new fighters and bombers and production of thousands of German planes of all type on a scale never before attained. Udet, as a young Lieutenant in World War I, ran up a score of 62 Allied planes, becoming the highest ranking German Ace following the death of Baron von Richtofen on April 21st, 1918. He was well known in this country having participated in the National Air Races for several years; his most famous stunt, snatching a handkerchief from the ground with a small hook mounted on the wing tip of his famous "Flamingo." Udet, more than anyone else, was credited with the technical perfection of that terrible air armada, the Luftwaffe. German Pursuit Squadron No. 3 has been named after him.

Colonel Werner Moelders, ranking Nazi Ace of World War II, lost his life in the crash of a transport plane. Credited with a total of 115 enemy planes, Moelders, 28 years old, was inspector of air-men manning fighting squadrons. He had a score of 14 planes in the Spanish Civil War, and the remainder registered against Polish, French, Belgian and British airmen. Moelders received the highest decorations of the Reich and was a symbol of skill, daring and bravery to youthful Luftwaffe pilots.

Captain Baron Franz von Werra, whose escapades read like a fiction novel, was recently killed in action over the Russian Front. Werra was shot down over England a year ago and sent to a Canadian prison camp, escaped from a prison train, crossed the St. Lawrence River in a rowboat and landed near Ogdensburg, New York last January. He was arrested by U.S. Immigration officers but jumped $5,000 bail and escaped to South America where he got a boat and joined his squadron in Germany last Spring. Only 27 years old, the daring airman was made a squadron commander and lost his life while leading an attack on Russian planes.

Major General Helmuth Wilberg, director of Luftwaffe military air training, lost his life in a transport crash while on a tour of inspection. Wilberg, 62 years old, devised the present system of Nazi pilot training.

Two Lockheed P-38 twin engine high-speed single seat interceptors, whose 410 miles per hour top speed credit them with being the fastest military airplanes in the entire world, were destroyed in similar crashes only a few days apart. First was an experimental ship, flown by Test Pilot Ralph Virden of the Lockheed Aircraft Corporation. The ship was the original re-designed model built following the crash of the prototype three years ago in New York with Lieutenant Ben Kelsey at the controls, and was engaged in terminal velocity dives over the company's vast Burbank, California factory. After falling more than 15,000 feet, the huge ship lost its entire tail assembly at 3,000 feet and plunged through the roof-top of a suburban Burbank home. The ship, flown thousands of hours in tests of new improvements and, although owned by the Army, was stationed at Lockheed for test purposes.

A similar ship failed to pull out of a dive over the vast California desert near Palm Springs and exploded, taking the life of Lieutenant Ellery Gross of the 51st Pursuit Group. With a companion, Gross was practicing "peeling off" maneuvers and the other ship successfully pulled out of its dive and returned to the field ignorant of the crash. Gross' ship went straight into the ground after a power dive from 10,000 feet, the subsequent explosion scattering the ship's remnants over a 100 acre area. The force of the explosion rattled windows in a village three miles away.

Ruth Nichols, famed woman record-breaking flier, has organized the first unit of National Relief Wings; aim is to provide aviation aid during earthquakes, hurricanes, fires, flood and other such disasters. Included in the corps will be nurses, pilots, doctors, amateur radio operators and available planes of private owners.

(Continued on page 55)

The Northrop "all wing" plane flying over the Mojave Desert during tests. Its swept back wing tips function as elevators and ailerons simultaneously. With the two front landing wheels retracted within the "wing fuselage" and without tail or orthodox fuselage, drag is decreased to a minimum, thus increasing speed

AIR YOUTH OF AMERICA

Academy of Model Aeronautics and Air Youth of America combine

A CONSOLIDATION plan of Air Youth and the Academy of Model Aeronautics was drafted in late November by a special committee, headed by N.A.A. Vice President William R. Enyart.

The plan, accepted early in December, transferred the Air Youth activity to the N.A.A. with the purpose of uniting and coordinating the efforts of furthering technical guidance and setting rules for model plane contests and meets.

". . . One of the principal aims of the new program will be to help bridge the gap through close cooperation of all branches of aviation with junior activities, nationally and locally."

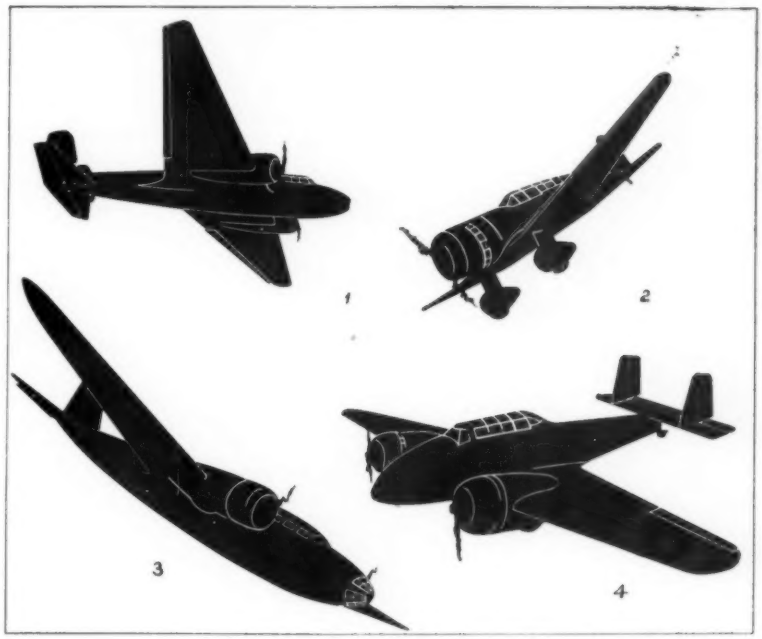
The N.A.A. Board of Directors will exercise general supervision. Laurance Rockfeller, Vice-Chairman of Air Youth, will serve on the N.A.A. Board of which Thomas H. Beck, President of Air Youth and President of the Crowell-Collier Publishing Co., is already a member. Kendall K. Hoyt, Manager of N.A.A., will act temporarily as director of the youth work until the post can be filled and thereafter will coordinate the combined activity.

Other members of the group headed by Dr. Lewis include Mr. Beck and Mr. Enyart. Further members were named by Gill Robb Wilson as follows: Richard C. duPont, President of All American Aviation, Wilmington, Del., and noted as a soaring pilot; Dr. Luther Gulick, Director of the Institute of Public Administration, New York; Philip G. Johnson, President, Boeing Aircraft Corp., Seattle, Wash.; C. S. Jones, President of the Casey Jones School of Aeronautics, Newark, N. J.; Edward Roberts, President of the Academy of Model Aeronautics, Philadelphia, Pa.; Paul W. Litchfield, President, Goodyear Tire and Rubber Co., Akron, Ohio; Clark Millikan, Past President, Institute of the Aeronautical Sciences, Pasadena, Calif.; William B. Stout, President of the Stout Skycraft Corp., Detroit, Mich.; Carl B. Squier, Vice-President, Lockheed Aircraft Corp., Burbank, Calif.; and Major Lester D. Gardner, President, Institute of the Aeronautical Sciences, New York.

VICTORY

SKY SCOUTS—AMERICA NEEDS YOU!

Join this Airplane Spotters League and help defend America



WITH war at our doorstep, imposing upon us the necessity of straining every nerve and giving every ounce of energy to bring it to a successful conclusion, we know that every model builder is most anxious to contribute in some effective way.

He can greatly help by qualifying as an airplane "spotter." The ability to recognize an aircraft passing over at some crucial moment may be the means of saving many lives, or bringing a military operation to a successful conclusion.

Model builders are familiar with many airplanes but probably not with the Japanese planes, because Japan has built its extensive airforce with secrecy.

We take pleasure therefore in establishing an organization called the "Sky Scouts." We would like to enroll every MODEL AIRPLANE NEWS reader in this organization. When enrolled he should read every article appearing in successive issues, study their contents, the silhouettes presented, and in every possible way fix in his mind the "look" and the characteristics of the given airplanes.

Anyone may become a member. When enrolled the Sky Scout should send in each month to the office of MODEL AIRPLANE NEWS, 551 Fifth Avenue, New York City, a list of the names of the silhouettes shown in that particular article. The names and characteristics of each one of these planes will not be given under the silhouette but instead within the article itself. The details of the craft are not required, *just the names.*

Of course, all the Sky Scout has to do is to copy the name from the article; nevertheless this necessitates that he at least read the article and in so doing he is bound to absorb much required information.

Upon the receipt of two correct lists—one for each month—from an enrolled Scout, he will be presented with a silver Sky Scout pin. When twelve successive lists are sent in, he will receive a gold pin and will be recognized by the organization as a full-fledged "spotter."

This month we start with silhouettes of four Japanese airplanes whose names and characteristics are as follows:

PLANE 1—Mitsubishi twin engine long-range bomber used by the Japanese Imperial Army Air Corps is an all metal mid-wing monoplane with a retractable landing gear. Equipped with two 900 hp. Mitsubishi Kinsei air-cooled radial engines; accommodates a crew of three to five. Models similar to this were also designed as freight carriers for the Japan Airways Company for "survey" flights from Tokyo to Teheran as early as April 1939. Dimensions: Span, 82 ft.; length, 52 ft. 6 in.; height, 12 ft. 1½ in. Weight, loaded, 11,000 lbs. Cruising speed, 162 m.p.h.; endurance, 10 hours.

PLANE 2—Mitsubishi "Karigane" Mk II (Wild Goose), a single engine two place high performance fighter capable of great flight range is used in appreciable numbers by the Japanese Imperial Army Air Corps. Powered with an 800 hp. Mitsubishi A 14 fourteen cylinder radial air-cooled engine equipped with standard NACA cowl and constant speed Hamilton Standard two blade propeller, the ship has cantilever wing design with fixed undercarriage, of metal structure with flush riveted sheet metal covering. Ailerons are fabric covered. Split-type trailing edge flaps are placed beneath fuselage, extending to within three feet of each aileron. Fuselage is monocoque with oval crossection. Fixed sections of the tail surfaces are also metal covered, movable portions are fabric covered. Cockpit enclosure begins at about the center of the wing section, extends backwards flowing into the vertical tail surface. Pilot is located at forward cockpit while full navigational and communication facilities are incorporated into the aft pit for an observer. Dimensions: Span, 39 ft. 5 in.; length, 27 ft. 11 in.; height, 11 ft. 6 in; wing area, 258 sq. ft. Weight, loaded, 5,060 lbs. Maximum speed, 310 m.p.h.; cruising speed, 200 m.p.h.; range, 1,490 miles.

PLANE 3—Nakajami Type 19, an all metal long range bimotor bomber equipped with two 870 hp. Mitsubishi Type IV engines. Of mid-wing cantilever design featuring monocoque construction and stressed skin flush riveted covering. It possesses split-type trailing edge flaps and retractable undercarriage folding forward and up into motor nacelles. Of clean aerodynamic design with statically and aerodynamically balanced elevators and rudder, the craft appears to possess excellent flight characteristics which make for good bomber aircraft. Information regarding performance or additional design characteristics and dimensions unfortunately are not available at this time.

PLANE 4—Mitsubishi Otori (Phoenix), is an all metal low-wing cantilever type monoplane equipped with two 550 hp. Nakajima Kotobuki III radial air-cooled engines. First designed by order of the Asahi newspaper, it was flown over 2,000 miles from Tokyo to Bangkok non-stop. Capable of accommodating crews of three to five, this craft now becomes a formidable weapon. Modified undoubtedly from its inception, the Otori may now be in use by the Imperial Navy, operated from aircraft carriers. If such is the case one may safely venture a prediction that this type of machine will be among those used for bombing American strategic positions and cities. Unfortunately, at the time of this writing little information regarding it was available.

Send To: Model Airplane News, 551 Fifth Ave., New York, N. Y.

I Want to Become a Sky Scout!

Name . . . . . .

Address . . . . . .

City . . . . . **State** . . . . . .

12. Members of the Prop Spinners Club assembled at their annual contest

13. The progressive Balsa Bugs get together for a few test flights

Air Ways

(Continued from page 23)

fuselage. He has also incorporated slots in the wing near the tips.

We wonder where builders got the idea that slots should be used only at the tips; perhaps they are copying large ships, if so they are doing this without purpose, for slots only at the tip have no particular significance in models. Slots at the tips prevent stalling at landing angles; a model flies only at small angles of attack and never reaches the high angles required to land a big ship. Tips of models therefore seldom stall and do not necessarily need slots, which should be incorporated the entire length of the wing to get full value. Then at high angles of attack wing efficiency is increased and steeper, faster climb results.

In picture 2 appears a beauty, built from plans of "The Bee" appearing in MODEL AIRPLANE NEWS, by Ed Bland of 1346 Hochelaga West, Moose Jaw, Sask., Canada. He says the remarkable thing about this ship is its flat glide. Landing, the ship comes in at such a flat angle that it is hard to tell exactly when it is on the ground. It weighs 25 oz., is silk covered and powered with an Ohlsson "23," decorated in orange and cream with blue trim.

Bland says this is his first gas model after eight years of rubber model building. The excellent workmanship speaks well for the practice of learning how to build rubber models well before attempting gas jobs.

Francis M. Williams of 646 W. Huntington Drive, Monrovia, Calif., sends us picture 3, showing his 52 in. parasol gas model, weighing 33 oz. and using a Clark Y wing section set at plus three degrees. The stabilizer is of the lifting type set at zero degrees; a good combination. It is powered with a Brownie mounted with no offset thrust. Fuselage construction is of the former and stringer type covered with Silkspan, rudder and stabilizer both covered with 1/32" sheet balsa. The motor mount is removable, held in place with dowels and rubber bands.

Though an excellent looking job, we fear the center of lateral area is above the level of the center of gravity. This could be corrected here with negative thrust of about two degrees. Then it is suggested that both the wing and stabilizer angles be reduced two degrees, lowering the c.l.a. relative to the thrust line and c.g.

Scale gas models are becoming very popular. Picture 4 shows a honey of a Luscombe "50," built by Walt Suchma of 138 Jersey Street, Trenton, N. J. The only change from scale is an increased wing dihedral. The ship, with 70 flights to its credit, has a span of 7-1/2 ft. and is powered with an Ohlsson "60." Mr. Suchma is an ex-employe of the Luscombe Aircraft Corp., where he had considerable experience in metal work. We are indebted to Lloyd Rake for this information.

Bob Abbett of 940 Drakert St., Hammond, Ind., sends us a picture, 5, of his Thermal Thumber, built from plans in MODEL AIRPLANE NEWS. Powered with an Ohlsson "19," he entered it in a Hammond High Aeronautics Club contest and "walked away with" first place—his first gas job, at that!

The original "Thumber" was one of the winners at the 1941 Nationals, a perfect contest model, especially from design standpoint. Contrary to appearances, the c.l.a. of this ship is on a line with the c.g. Many builders think that because the ship is of the high pylon parasol type that c.l.a. is high; such is not always the case. In this plane the thrust line passes rearward and out of the top of the fuselage immediately to the rear of the pylon piece. Thus all the side area of the fuselage, fin and wheels is below the thrust line and the c.g., for here the c.g. is approximately on the t.l. The c.l.a. actually is just above the rear surface of the fuselage. This setup makes a very steady high-climbing model which under power has a tendency to circle gently with a greater circling tendency on the glide, the latter enabling it to remain in thermals.

F. W. Neidinger of 1952 Park Grove Avenue, Los Angeles, Calif., sends us picture 6 of his solid scale Lockheed Lodestar, a 30 in. model finished beautifully in United Air Lines colors. Workmanship both in model and finishing is excellent.

In picture 7 F. C. Oertle of Philadelphia holds aloft his miniature Super-Atom gas job which flew at the Sky Scrapers Meet and recently, on a test flight, flew for 40 minutes and on several occasions it has flown out of sight. Oertle doesn't tell us how he retrieved it.

Clyde R. White of 1109 L Street, Bakersfield, Calif., publicity chairman of the Bakersfield Gas Model Airplane Association, tells us of the successful conclusion of a marathon type of contest held on November 9.

"First, here is the way a marathon contest is run. Each contestant is allowed a total of five flights with maximum motor run allowed 15 seconds. The object is to complete as many flights of one minute or more using a motor run as short as possible, not to exceed 15 seconds for each flight. The contestant completing the most flights with the least possible engine run wins.

"We feel this type of contest has many advantages. The element of luck is cut to a minimum, as five thermals in a row is too much to hope for. Also, the con-

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How can spiral dives be prevented?
How can a plane be made to fly straight?
What is the best wing section to use?
How large should the stabilizer be? the fin?
What is the center of gravity and how can it be found?
How is lift generated and calculated?
At what angle should the stabilizer be set?
How can a plane be made laterally stable?
How big should a model plane be? How much power should it have?
What makes a plane nose dive?
What size propeller should be used?
How can blade area be calculated?
What pitch is required for a given flying speed?
How do gas model propellers differ from rubber props?
How much rubber should be used in a motor for any given weight?
How many turns can be stored in a motor?
What makes a gas engine run?
How can a model be made stable yet efficient?

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THE AUTHOR

Charles Hampson Grant

received his training at Princeton Engineering School and Massachusetts Institute of Technology which led to designing U.S. army ships in World War I. His glider experiments and work with large planes as early as 1911 earned a coveted membership in the "Early Birds." For 20 years he has been the world's foremost model flying authority, and for the past ten years has been Editor of MODEL AIRPLANE NEWS*—all of which is reflected in this, his life's work.*

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testant must use judgment in cutting his engine run down as much as possible and still get a minute on the flight. Since flights of more than a minute are unnecessary, anti-out-of-sight devices, such as spoilers, may be used. And last, the contestant is not jeopardized by having his model fly out of the timer's vision."

Results of contest:

Winner	Flights of 1 Min. or More Completed	Total Engine Run
Joe Menezes	Five	49.6 sec.
Charles Allen	Five	50.5 sec.
Vernon Oldershaw	Five	54.6 sec.
Jess Beech	Four	50.9 sec.
John Werts	Four	53.8 sec.

Picture 8 shows winners of the contest. Left to right: Charles Allen, Joe Menezes, Vernon Oldershaw. The little boy on the right is not one of the winners—yet—but from the looks of things it will not be long before he is flying with the rest of us.

The Bridgeport (Conn.) Fall Rubber Championships postponed from September, were held on October 26. Breezy weather prevailed but several good flights of over 2 minutes were turned in. Final averages were low because a 2 min. flight meant a model out of sight. One stick job actually disappeared, high up, in only 61 seconds. The Hartford contingent did well, taking a 2nd, 3rd, 4th in the Open Event. Harry Keshishian, a former Boston flier, captured the Bridgeport Aeronuts Rubber Championship Trophy, taking a 1st and 2nd place.

Picture 9 shows, left to right: Robert Porter, Philip D'Ostilio and William Wargo.

Results were: Moffatt Event: Robert Garnett with 1:15.3 average; H. Keshiahian, R. Porter, W. Wargo. Open Event: Harry Keshishian with 1:49.3 average; J. Levy, J. Rice, W. Losin.

The Open Class included any type of rubber powered model, no weight or area rules, allowing the beginner a chance to enter the contest and did not confine originality.

The club will hold its Winter Gas Model Championships at Boston in January. Write to Ed Whittier of 949 Academy Hill, Stratford for further information.

Picture 10 shows another typical contest model, built by Ted Enticknap of Seattle, Wash., Route 9, Box 237. Ted seems to feel some modelers object to this type of ship believing it won't perform well. He is right when he says it is an exceptional contest job, especially when the thrust line is negative and not parallel with the fuselage axis. This brings the c.l.a. low and provides stability under all flight conditions. If the c.l.a. is high this type of ship climbs beautifully as long as its nose is pointing skyward but has spinning tendencies when flying horizontally. Keep the ship climbing and you are safe.

Over a period of three months Ted's model has made 100 flights with no bad characteristics making their appearance. The ship is equipped with spoilers to eliminate out-of-sight thermal flights. He says the spoilers need not be large, even small ones have a tremendous effect and he would not have the model to date without this device.

A fine, unusual looking job is shown in picture 11. Here Walter Coburn, Jr., holds his Class C plane of original design, which recently won the Craftsmanship Event in a contest held on October 19, sponsored by Albert Katz Model Aircraft & Camera Supply Co., 422 N. Charles Street, Baltimore.

The Prop Spinners Second Annual Contest was held on September 21.

The day was grand and thermals were at the modeler's "beck and call" as can be seen by flight time and high time flights shown below.

Class A

	Average Time	High Time
Elmer Granitzki	6.15	13.33
Don Baird	5.58⅝	16.30
Mr. Wittenberg	2.14⅛	6.42

Class B

Frank Morse	7.10	9.44
Art Heilsberg	6.30	13.42
Sally Corrodo	6.08	7.56

Class C

Irwin Bartoes	11.13	21.46
Charles Giessen	10.08	28.25
Fred Lewis	7.41	9.25

14. C. H. Dollmeyer extricates a few "bugs" from his motor

A big crowd enjoyed the thrills of the day. As in other large contests, crack-ups were numerous, as were the downcast faces of contestants when they picked up their wrecks. Thermals were in evidence from about 9:30 a.m. to 3 p.m. All in all a very successful meet.

A group of club members are shown in picture 13, with some of the trophies and prizes.

David Crown of 3410 W. Douglas Blvd., Chicago, publicity manager for the Chicago Balsa Bugs, tells us that as a club project they are working on a Class C fuselage job of great possibilities. Though all classes of models are built by the members, they major in C gas and C rubber of original design. Anyone interested in joining should contact Stephen Moreland of 213 W. Locust St.

Picture 13 shows a group of the club members, including Marvin Hauser, David Crown, Manuel Hyman, Leroy Lorenzo.

Picture 14 shows C. H. Dollmeyer tuning up a motor during a lull in the Northern Illinois Model Championship Meet. We are indebted to Eugene Welch, secretary of the Downers Grove Thermal Hunters, 1224 Gilbert Avenue, for this picture.

Washington, D. C.

An important letter comes from W. D. Skolochenko of 343 Raleigh Street S. E. It is addressed to Mr. Al Lewis, secretary of the A.M.A., and takes up a matter close to the interest of all modelers.

"The question of lost gas models has become a very touchy subject among fliers; the mere mention of the flying ability of one's super thermal picker, which you've lost at a recent contest, will start an argument that will break up a beautiful friendship. The weight and displacement bugaboo is immediately injected into the picture. The qualities of the dethermalizer and parachute are added as fuel to the burning question of lost models.

"I am not going to argue for nor against these changes in rules; the readers are not interested in my opinions. Smarter modelers than myself have gone out on the limb. (It's only one month since I fell some 30 feet trying to retrieve my C job from the tall timbers. One fall is enough.) I think we can lessen the hazard of lost models by a legal registration, as well as a technical change in rules. Here is my suggestion and contribution to the hot issue.

"Registration of motor serial numbers by A. M. A. and motor manufacturers. Make it compulsory by proper rules and regulations that all models entered in any A.M.A. sanctioned contest shall be registered both by ship and motor number issued by A. M. A., ship bearing A. M. A. membership number as of now. And engine shall be registered by engine manufacturer's serial number. All ships and motors lost shall be reported to A.M.A. by the contest director.

"Should any contestant enter a contest, registering a ship with an engine listed as a lost or stolen engine, he will be barred from the contest and his ship and motor held in custody by contest director. Not until the contestant can prove by registration or bill of sale, or proof of swap, trade-in or any other form of model barter, that the engine is rightfully his will the model be returned, and contestant given a clean slate.

"This will require the utmost cooperation of the model fliers as well as the dealers. They must notify A.M.A. of any swap, trade-in or gift that they make concerning model motors. Most engine manufacturers have a system of engine registration, namely: Ohlsson & Rice, Cyclone, Sky Chief, Phantom, and a host of others.

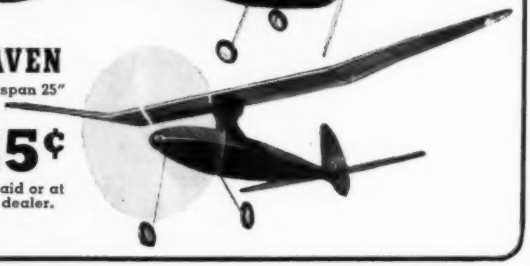
"All that is needed is to empower A.M.A. with the authority to register motor serial numbers, and permit contest directors to hold lost or stolen gas model planes and engines when the opportunity arises. Dealers can do the same.

"A flier confronted with the fact that he cannot enter a contest or send a motor back for repairs or replacement, or trade it in or swap, must either return it to its rightful owner or change the serial number. Changing the serial number seems simple, but is it?

"A company knows how many motors it has manufactured. Therefore, a num-

25" CHAMPIONS

DOODLE BUG
Wingspan 25"
25¢
Postpaid or at your dealer.



RAVEN
Wingspan 25"
25¢
Postpaid or at your dealer.

NEW No. 1 Scientific GLIDER

NEW! Wing tapered . . . rudder, stabilizer and fuselage cut to shape!
Wingspan 20⅛"
Length 18"
25¢

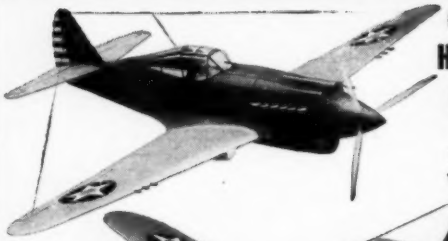
Easy to construct . . . and when completed, this glider is the most beautiful on the market! When you fly it—Boy!—no use talkin'! Words weren't made for flights like this! And only a quarter! How's that for value? With all these features, is it any wonder that it's so popular?

ZENITH Double-Purpose SOARING GLIDER

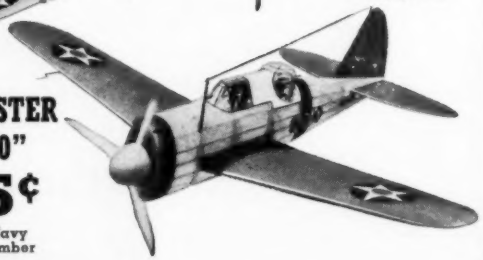
*Wingspan 33¼" *Length 21½" *Class "B" A.M.A. Rules
DOUBLE Purpose . . . It's a GLIDER AND a FLYER!

Kit is complete with everything needed to build both Glider and Flyer.
50¢

DEFENSE SERIES



CURTISS HAWK P-42
95¢
U. S. Army Pursuit Plane
Wingspan 30"



BREWSTER "340"
95¢
U. S. Navy Dive Bomber
Wingspan 30"

PRIZE-WINNING

Created by Scientific . . . they

FLAGSHIP . . . Class "

*Wingspan 78"
*Wing Area 850 sq. in.
*Overall Length 44½"
$5.5

ENSIGN . . . Class "

*Wingspan 50"
*Wing Area 372 sq. in.
*Overall Length 34½"
$3.5

STARLING . . . Class "

*Wingspan 40"
*Wing Area 210 sq. in.
*Overall Length 27¼"
$1.9

Hey, Fellas! Look at This Bargain!
SYNCRO PC-2 KITS
Regularly $4.95
WHILE THEY LAST!
$4.25

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MODEL A
"Gas M
218-220 MA-2 M

NG AS SENSATIONS

they king records from coast to coast!

Class "C" ERCURY ... Class "C"

$5.5

gspan 6 Ft.
g Area 720 sq. in.
erall Length 52"

$5.50

Class "B" ARSITY ... Class "B"

$3.5

gspan 50"
g Area 370 sq. in.
erall Length 33½"

$3.50

Class "A" RONET ... Class "A" or "B"

$1.9

gspan 46¼"
g Area 300 sq. in.
rall Length 30"

$2.50

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"Gas M arters"

MA-2 M NEWARK, N. J.

GAS ENGINES

OHLSSON "19"—Class "A"	$14.50
OHLSSON "23"—Class "B"	$16.50
NEW! OHLSSON "60" SPECIAL—Class "C"	$18.50
FORSTER "29"—Class "B"	$18.75
BROWN "D"—Class "C"	$12.50
NEW! SUPER ATOM	$15.50
BUNCH "Mighty Midget"	$12.50
ROGERS "KD-29"	$ 4.95

NEW 30" MODELS

CLARION

Wingspan 30"

50¢

Postpaid or at your dealer.

BULLET

Wingspan 30"

50¢

Postpaid or at your dealer.

PARACHUTE PLANE

with Automatic Trap-Door Release!

Wingspan 40"
Length 28"

$1.50

Postpaid or at your dealer.

Imagine! After climbing three hundred feet or more, out comes a pilot with his parachute—and it's all done automatically! But that's not all. Besides this novel parachute feature, you have a trim endurance model that will easily make flights of a mile or more. Look at the long graceful wing; elevated and adjustable too; that classy open cockpit in a slim streamline fuselage measuring 28 inches in length. It will be the envy of every fellow in the neighborhood. Kit contains all necessary materials, including a machine cut propeller, ball bearing washer, tissue (2 colors), formed wire parts, all parts required for constructing parachute and automatic trap door release, ready-made pilot, and a full size, easily understood, plan.

GAS-TYPE "HITS"

They look, fly and sound like Gas Models!
They're easy to build and instructive!

FLEA

Wingspan 36"

$1.95

Postpaid or at your dealer.

Miss America

Wingspan 40"

$1.95

Postpaid or at your dealer.

NOTE:
Either model may be converted easily into a Class "A" gas model by using the "Super Atom" motor.

ber exceeding those that have been manufactured will "corner" him. A number that is already registered will do the same, even though it be his own. He cannot have two motors with the same serial number. Contest directors can make contestants register all powered craft in one class, including spare ships.

"This system has had its test with the Capitol Model Aeroneers of Washington, D. C., of which I am a member. Several members have recovered lost and stolen models through club registration of motor serial numbers. The local police were very cooperative. However, if A.A.M. is given the authority and members abide by its rules and regulations the question of the long arm of the law will not be needed in the majority of such cases that will present themselves.

"Hoping that this new slant on the partial solution of lost models will help further the cause of model flying and its progress, I remain your Washington model flier who, had he not lost his 'B' job on its first flight, would have won that gorgeous trophy and Ohlsson '23'."

Australia

From far-off Australia Mr. A. G. Hull of 117 Reservoir St., Sydney, president of the Model Aeronautical Association, sends us some comments on his experiences with high wing and power loadings.

"The subject of increasing the power loading for gas models is mentioned in your October issue.

"You may be interested to know that our local Model Aeronautical Association has been trying a few experiments in this direction, here in Australia. Unfortunately our results are anything but happy.

"About six months ago it was decided to increase both wing and power loadings by 50%, bringing them to 12 ounces per square foot and 7-1/2 lbs. per cubic inch respectively. It was expected that this would stop vertical climbs, but completely failed in this respect. It was found that a model with an Ohlsson '23' could weigh 1-3/4 lbs., with a wing span of 48", and still rocket up like an anti-aircraft shell.

"On the other hand the older motors failed to put up anything like the same performance with their 4-1/2 pounders. They were more expensive to build, bulky to carry and inclined to wreck when landing against posts or brick walls. The rule put a premium on the ratio between piston displacement and effective power. This incited builders to try to increase the power from their motors, by raising compression ratios and using dope fuels. When carried out by amateur mechanics such efforts sometimes affected the motors' reliability.

"It was then decided to go to the other extreme. A class was introduced for 'unrestricted' models, the only limitation being a 12-second motor run. Even hand-launching was permitted to put an end to all arguments about unassisted takeoffs. It has made possible the construction of light, simple and cheap models with thrilling performance. It has not, however, done anything towards satisfying the type of model flier who thinks that a model should look like, and fly like, a full size ship."

Results of experiments in this country with models of this type do not check entirely with Mr. Hull's findings. It has been found that though susceptibility to thermals is not eliminated, it is decidedly decreased by high wing power loading. We will be interested to hear whether or not readers have had the same experiences as Mr. Hull. We would prefer not to have their opinions but the facts concerning experiments made.

California

H. E. Fredrickson of 1715 Washington Blvd., Venice, sends us the list of winners in the first Los Angeles gas model airplane contest held on November 2 at the Gas Model Airplane Assn. of Southern California model airport, Rosecrans and So. Western Avenues.

Ralph Brandenberg, Los Angeles	28 :52 :00
Hal Johnson, Beverly Hills	23 :07 :00
Vernon Oldershaw, Bakersfield	22 :45 :00
Sandy Abrenica, Los Angeles	15 :17 :00
James Squire, La Mesa	14 :42 :00
Frank Cummings, Los Angeles	14 :34 :00
John B. Warner, Wilmington	12 :49 :08
Hank Scholler, Beverly Hills	11 :42 :02
Bill Rowe, San Bernardino	11 :30 :00
Ray Acord, Hollywood	11 :16 :04

Hank Scholler, winner of Class B Trophy.
Frank Cummings, winner of Class C Trophy.

Dickie Berry, winner of Junior Trophy	7 :57 :05
Mrs. J. O. Bunting, winner of Ladies' Trophy	2 :35 :00

Indiana

From Lloyd Weaver of 1209 North Meridian, we hear:

"The Brazil Winged Modelers, a group of high-school-age boys who were organized last May, held their first invitation meet October 12. Modelers from five states attended.

"High point man was Herman Batt, New Castle, who won the grand prize with a time of 4:06 min. He also won a first in Class B, a second in Class A and first in the U-Control.

"Robert Lerch, Marion, won first in Class C; Jack Preston, Noblesville, second; Ed Laurer, Crawfordsville, third, also won the novelty event. Harold Stofer, Indianapolis, won second in Class B; George Patterson, Indianapolis, third. Frank Ball, Indianapolis, first in Class A; Clarence Baysinger, Jr., Brazil, third."

Puerto Rico

We have news from Luis Rodriguez of Jobos 30 St., Ponce, Puerto Rico, who tells us that the local model airplane club is growing slowly but steadily. In one of their first meets, held recently, the winners were: Manolo Ramirex, as airplane mechanic; Luis Barini, Luis Rodriguez.

Mr. Rodriguez will be glad to hear from other modelers. We hope he sends us more news of model activities in this locality.

New York

An unusual competition for members of the Schenectady Aeroneers has been planned for a future date. With club members split into two groups, all will construct the same type of cabin model, previously selected by the club. As teams they will fly the models in competition.

The group whose planes have the lowest average time will treat the winning team.

Members of team 1 are: Harold Hine, Albert Streeben, Robert Farstad, Jacob Smith, Garrett Sommers, Charles Hangs Otto Klima, Robert Flood, Harold Bradish and J. Paul Lusk.

Members of team 2 include: H. J. Schneider, Albert Reed, Aubrey Pearson, Kiely Psimaris, Frank Heitkamp, Emil Kremzier, Emmett Newman, Dalton Patterson, Stanley Cichy and Edward Freiburghouse.

John Schneider, with an average time of 1:24.4 in the Gas Model R.O.G. Class C, was winner of the Aeroneers' last official record trial meet of the season at Albany Airport, Albany, October 25. H. G. Bradish with a 0:39.6 average was second. In the Cabin R.O.G. Event, Schneider was also winner with an average of 4:26.6, while Albert Streeben was second with 245 sec. Streeben, however, won the Hand-Launched Stick Class D Event with an average of 45 sec.

A feature of the meet was the autogiro flight of a model made by Albert Reed, the first time such a flight had been made in Aeroneers' competition. The model averaged four seconds in the air.

In the Towline Glider Class D Event, Emmett Newman's model won him first place with 19.3 sec. Schneider came back for another win with a time of 40.9 seconds in the Hand-Launched Glider Class D Event. He also won Class B Hand-Launched Glider Event with 39.3 sec. Reed was second with 27.8 and Stanley Cichy third with 19.1 average.

West Virginia

R. H. Frasher, Jr., of Elkview, writes and tells us that on October 5 a contest was held at the Charleston Airport. Times were low because of high winds sweeping the field throughout the day. Frasher says nearly all modelers lost ships; he lost two. Later his plane was found by a coal miner, 12 miles from the airport; it had landed on a coal slate dump and was pretty well banged up.

Frasher says model building and flying is still in its infancy in the Charleston area but the Exchange Club is now taking up the promotion of model contests and it is hoped there will be some real results by next summer.

Philadelphia

Mr. Walter Beaumont of 8049 Ferndale St., writes that Robert Linn of 8043 Ferndale St., a member of the Quaker City Gas Model Association, has just been sent to a Pennsylvania state sanatorium because of ill health. He has been building models for a number of years and Beaumont suggests that model builders take a little time off and drop him a line.

M. A. S. A.

Here is a comment concerning the Model Airplane Sportsmen Association, from Private F. Munson, D-12-4, Fort Bragg, N. C.

"Just a word to let you know of my hearty endorsement of MODEL AIRPLANE NEWS' plan for an M.A.S.A. I hold with those who feel that present day models and flying rules show nothing and contribute nothing to aeronautical progress. If and when your plan develops, count me in.

"Incidentally, I am still flying here at Fort Bragg. Because of lack of space I cannot fly a free flight model, but I am having a fine time with a U-Control model powered with a Forster 29. Colonel Butner has the same combination as I and we hope to run across some others in order to hold a contest of our own."

We will be pleased to hear from other builders interested in forming such an organization. Incidentally, it looks from Munson's letter that some of the oldsters are becoming interested in models.

VICTORY

The American Model Builder Is Discovered

(Continued from page 24)

suggest speakers and hold inter-club competitions? If the answer is "no," then you're the one who is losing—missing an opportunity to learn more by watching the other fellow, to associate with those who have the same interests as yourself.

So why not more harmony between clubs, the Instructor asks. Less jealousy and more genuine friendship. Exchange of ideas is one of the most important aspects of our hobby—so don't let it down by drawing into a shell of smug selfishness and ignoring your fellow fliers.

For our moral we point to the two clubs that are flourishing in Allentown, Pa. The

MAKE '42 PAY YOU—More Fun, More Profit, More Aviation Fundamentals from Your Model Building by Building

CLEVELAND MODELS

"America's First Line of Flying Model Airplanes." Let them help you if you plan an aviation career. Every good model builder builds one good "scale job" per month.

They Win More Compliments, More Prizes, More Honors Than Any Other Line of Models in the World!

GRUMMAN SKYROCKET

(THE C-D KIT OF THE MONTH)

"The Terror of the Skies"

The twin motor design (two 1200 h.p. Wright Cyclones) that is now hailed as the top ranking possibility as our Navy's "Terror of the Skies" and bristling with cannon and machine guns with its reputed 450 miles per hour speed, has great fire power. This ¾" scale model of 31½" span is the first twin motored design in the famous ¾" (SF) Cleveland line to be offered at such a low price. Both motors powerfully pull the model along in beautiful fast flights following that of the prototype. This model, while still on the military secret list, includes all publicly known details. Colored yellow and blue. Master Kit SF-75 only **$3.50**

AN AVIATION MILESTONE • C-D • DESIGN

Cleveland's Newly Adopted Emblem for Master Scale Models

15¾" DOOLITTLE'S GEE-BEE. Master Kit SF-27 ..... **$2.00**

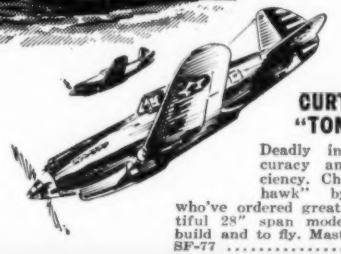
German ME-109 Messerschmitt

Sleek 24½" model of the Nazi's mass production fighter. Capable of good fast flights. Master Kit SF-74 ..... **$3.00**

"CANNON-PLANE"

AIRACOBRA

Striking 25½" model of the plane that is fast coming to the front as the U. S. A.'s and England's standard pursuit interceptor. Due to its long projecting nose, it's a perfect high speed flyer. If you prefer, the 2-wheeled Airobonita may also be built from these plans. Master Kit SF-76 ..... **$3.00**



CURTISS P-40 "TOMAHAWK"

Deadly in swiftness, accuracy and fighting efficiency. Christened "Tomahawk" by the British, who've ordered great numbers. Beautiful 28" span model. A beauty to build and to fly. Master Kit SF-77 ..... **$3.00**

yellow and blue. Master Kit SF-75 only **$3.50**

Adopted Emblem for Master Scale Models

a perfect high speed flyer. If you prefer, the 2-wheeled Airobonita may also be built from these plans. Master Kit SF-76 ..... **$3.00**

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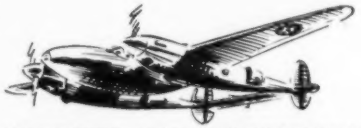


LOCKHEED P-38 "LIGHTNING"

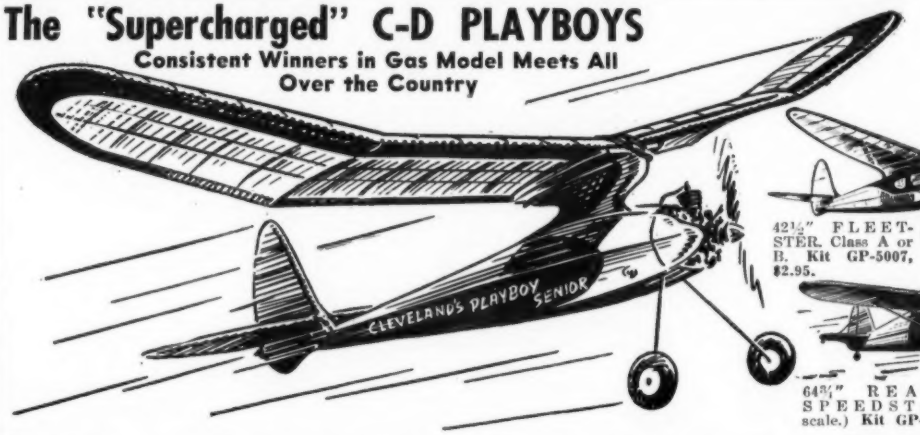
The world's fastest fighter, so fast that you don't hear it, they claim, till it's past you, beautifully modeled. Span 38¾". A superpowered twin motor model that's speedy, realistic and an absolute "must" among model builders who want the newest and best. Master Kit SF-85..... **$4.00**

BRITISH SPITFIRE

This realistic Cleveland model of the "Pride of the RAF" is the pride of any builder. Beautiful 27⅝" model of England's popular interceptor fighter. Large wing area makes this an excellent flyer. Speedy. Master Kit SF-78..... **$3.00**

The "Supercharged" C-D PLAYBOYS

Consistent Winners in Gas Model Meets All Over the Country



SENIOR Class C. Huge 80" span. Broke World's record twice in one week. A constant winner everywhere because of its rapid rate of climb. Complete Kit GP-5017 (except power unit) **$4.95**

JUNIOR Class B. Span 54½". (360 sq. in.) Build it, and be the "dark horse" of every meet. Complete Kit GP-5006 (except power unit). **$2.95**

BABY PLAYBOY Class A. For Atom motor or rubber powered. Biggest gas value on market. Span 33". Complete Kit GP-5008 (except power unit) **$1.00**

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42½" FLEETSTER. Class A or B. Kit GP-5007, $2.95.

82½" STINSON RELIANT (2" scale.) America's Most Popular Radio Controlled Design. Kit GP-66, $12.50.

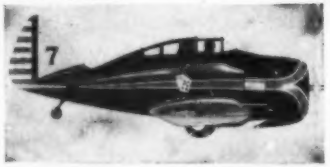
64¾" REARWIN SPEEDSTER. (2" scale.) Kit GP-69, $8.50.

48" VIKING. Class A or B. Kit GP-5020. $1.95.

52" CLOUDSTER. Class "B". Kit GP-5004, $2.95.

33" ITSY BITSY. Class A. Kit GP-5016, $1.00.

27¼" LOCKHEED ELECTRA. Kit D-65, $2.50.



SEVERSKY P-35 Fighter. Latest version is known as "THUNDERBOLT" Kit SF-61.... **$2.50**

BIG **7 FT. SPAN**

CLEVELAND CONDOR Soaring Glider, Span 84". Class D or E. Complete Kit E-5019, $1.00.
CLEVELAND EAGLET Soaring Glider, Span 48". Class C. Complete Kit E-5018, 50c.

CURTISS GOSHAWK F11C-2 Span 23⅝". Kit SF-49 only, $3.00.

23⅝" CURTISS HAWK P6-E. Kit SF-21, $3.00.

Send 5c for New # 37 Airplane Catalog of all famous C-D Models.

Other Catalogs
R. R. Catalog 5c
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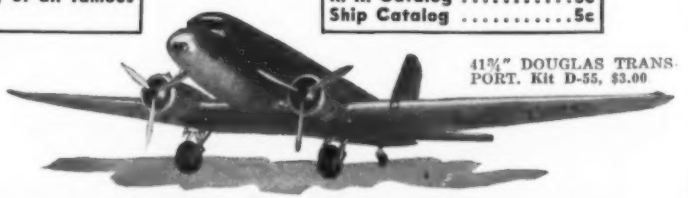
22½" BOEING P12-E. Kit SF-8, $2.00.

20" GREAT LAKES SPORT TRAINER. Kit SF-1, $2.00.

C-D DRAWING SALE

Send 5c for Airplane Catalog No. 37 listing drawings of discontinued kits. Thousands of you have asked for them, so now take advantage of this special offer. While they last only.



41¾" DOUGLAS TRANSPORT. Kit D-55, $3.00

35" MARTIN BOMBER. Kit D-45, $2.50.

There's More Fun, More Education in Building ONE Cleveland Master Model • Than DOZENS of Ordinary Models!

All Cleveland SF and D models shown on these two pages are "Master" Models. Engineered to ¾ or ½" scale, they are practically a twin in miniature of the big planes they represent, their prototypes. Yet withal, because of the extremely clear instructions and simplicity of design, they are not difficult to build. Kits are all the new improved type.

Cleveland Model & Supply Company, Inc.

World's Largest Manufacturers of Quality Model Aircraft—Since 1919

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ORDERING INSTRUCTIONS

If your dealer can't supply you, send check or money order—cash at your own risk. Minimum order $1.00. Shipments outside U. S. add 10%; England and Canada; 20% all other countries. (Remittances must be in U.S. funds.) For P.P. Special Delivery in U.S., only add 25c. (Ohio residents only, add 3% sales tax.) All kit contents and prices subject to change or cancellation without notice.

Allentown Model Cadets are an exclusively "rubber powered" club and in the membership are enthusiasts of all ages. The Allentown Gas Model Association is a strictly "gas" group. The two organizations send member prospects to one another, check on contest dates and lend a helping hand whenever needed.

If Allentown can do it, your community can do it. Get wise, quit shoving the other fellow around. If ever model aviation needed unified action, it is now. We have everything to gain, or everything to lose.

Thanks for sticking with us during this tirade. More pleasant thoughts next time, honest!

The Nationals Winning Pacer

(Continued from page 9)

1-5/8" is cemented to the fuselage at the extreme rear (see rudder detail). Another piece of aluminum 1/2" x 1-7/8" is formed as shown on the plan and cemented in place. Drill a 1/16" hole through both pieces of aluminum and trim one end of a piece of 1/8" dowel to 1/16" round. This peg is inserted into the holes in the aluminum and into the crutch. To remove the rudder, the peg is taken out and the rudder slips out of the tubing and off. The turn adjustment is controlled by bending the aluminum either way.

The cowling is drawn to scale making it necessary to enlarge the drawing before proceeding with the construction. Mark off on a piece of paper, one half inch squares equal in number to the smaller squares of the cowl drawing. Now reproduce the drawing in the large squares as it is in the small squares. Select a medium piece of balsa 5" x 5" x 3" for the cowling. Fit the block into the fuselage and cement lightly. After several hours of drying the cowl is ready to carve. After shaping and sanding the outside to shape remove the cowling and cut out the inside. Carve the cowling to approximately 5/16" thickness all around. The bottom block is made similarly except that it is cemented permanently in place.

Motor mounts are made of basswood and are bolted to the gumwood longerons. Mount the motor on the basswood mounts as shown. The coil is enclosed in a 1/8" sheet box and cemented in the bottom of the cowling. Let the high tension wire clip protrude from the box in order to attach the high tension wire. The condenser is mounted on a clip bolted to the firewall. The outside battery box facilitates battery change. It is made of 1/8" sheet with .034 wire springs attached to the top where the wiring is attached. After the motor has been mounted the exhaust hole can be cut out and a hole to fill the gas tank while the cowling is on. Don't forget the reinforcement piece across the top of the cowling. 1/8" dowel is cemented to the bottom front of the wing rest. It should protrude about 1/2" because the rubber that holds the wing is looped over it. After the timer has been mounted the wiring can be completed. Use multi stranded wire as it is less liable to break from the vibrations. If in doubt follow the wiring diagram on the plan. The batteries and cowling are held in place by stretching a rubber band between hooks; one on the cowl to the fuselage on one side, and a hook on the cowl and one on the fuselage rear of the batteries on the other.

Stabilizer and Rudder

A full size drawing of the rudder is necessary before it can be built. The rudder has an ordinary flat cross section and is simple to build. Force a piece of 1/16" wire into the rudder and cement it firmly as it is the front pivot.

After drawing the stabilizer plan by the previously described method start building. Be careful when drawing full size parts to use correct size squares. Lay down in order, spar, leading edge, and trailing edge. Cement 1/8" x 1/2" ribs in place and allow the entire unit to dry thoroughly. After removal from the workboard shape the ribs with a knife or any other suitable instrument. Temporarily attach the stabilizer to the fuselage with pins. Cement B9A to the stabilizer and insert the stringers. The underslung rudder, cut from 1/4" sheet, is cemented on *after* the stabilizer is covered.

Wing

Again make a drawing of the wing before starting construction. If the wing is drawn on thin paper or tracing paper, only one half the wing need be drawn. The paper can be reversed and the other half of the wing can be built. Elevate the bottom spar 1/8" from the plan because of the undercamber. Ribs are then fitted into position, and the leading and trailing edges attached. Then the top spar is added and the wing is dried for several hours. After the other half of the wing has been built, the halves are cemented together at the proper angles. Joints are reinforced with 1/8" sheet gussets and the ribs with 1/8" sheet triangles. Attach the sheet wing mount and cover the leading edge of the wing up to the top spar with 1/16" sheet balsa. Cap strips are now added on top of the ribs and over the trailing edge. Sand away the strip at the trailing edge as shown on the full size drawing of the wing rib. A small piece of light aluminum is attached to the wing center as reinforcement against chaffing by the rubber wing tie.

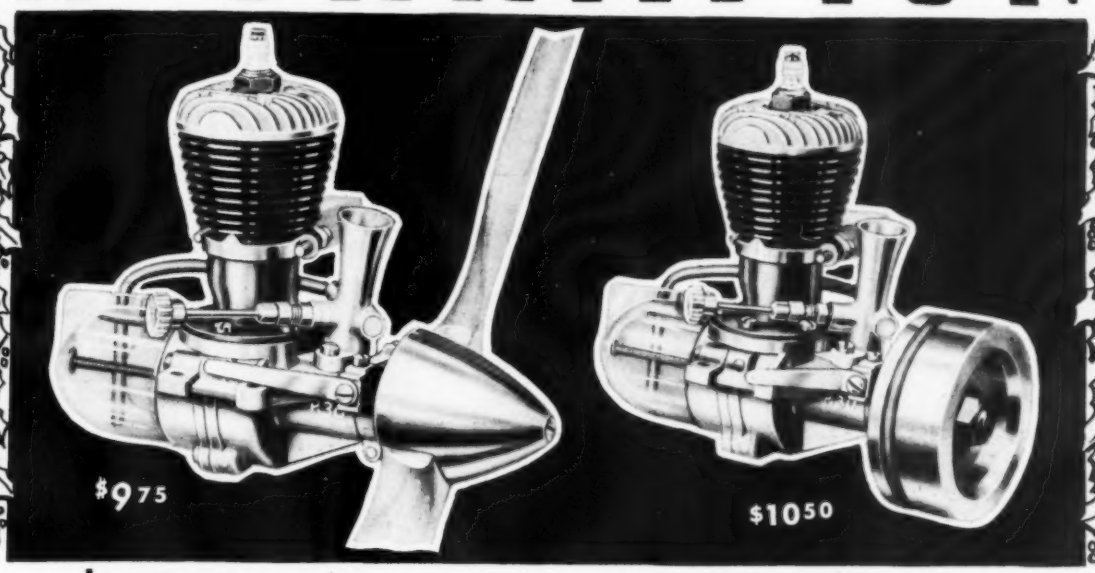
Covering

Cover the fuselage with silk if possible, although Silkspan or bamboo paper is almost as good. Double tissue, bamboo paper, and Silkspan each have merits as a wing covering. However if double tissue is used, be sure to cross the grain of the two layers. Give the surfaces about four coats of dope and the fuselage about six. Use a half dope —half cement mixture for applying the covering.

Flying

A few days after completion check the model surfaces for warps. The Pacer wings and tail are constructed solidly enough to resist warping, but if warps do occur take them out. Enough Pacers have been built to prove airworthiness, and by carefully making flight adjustments championship performance will result. The wing is set at zero degrees, and stabilizer with reverse camber, at 1/2" positive incidence. Set the rudder 1/4" to the *left*. Two degrees left thrust and two degrees down thrust are the requirements for motor

A CHAMPION



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setting. Glide the ship several times putting more or less incidence into the stabilizer. Remember! Careful slow adjustments save much time and effort.

Set the timer between 10 and 20 seconds for the first flight and use very low power. Launch the Pacer and watch the flight very carefully. Under power the Pacer should climb in approximately *fifty* foot circles to the *right*. When the motor cuts, it should gradually turn to the *right* and glide in about two hundred foot circles. Each model may have individual flight characteristics but all Pacers, without exception, climb to the *right* under power, and glide to the *left*. If the ship reacts favorably on first flight, fly it again with the same power and motor run. The ship should be flown about ten times, gradually increasing the power to maximum.

If you have followed instructions, and were guided by common sense, you now have a perfectly flying ship that will afford you many hours of satisfaction, and what's more, an excellent chance to win.

VICTORY

Academy of Model Aeronautics

(Continued from page 14)

most appealing we have run across was that made by Edward L. Krum of Lawrence, Kan., who wrote, "Please send me full information concerning the Academy of Model Aeronautics and its sporting licenses. I want to start the New Year right."

One of the most difficult phases of model aviation is keeping up with those who participate in the sport for a while and then go on to other activities. We know, of course, many modelers end up in the aviation industry but it is interesting to find out that those who have participated in the sport look back with appreciation on their modeling careers. Harry E. Lewis, Jr., now in the U. S. Navy and stationed aboard the U. S. S. CHESTER, contributed a sort of unsolicited testimonial when he wrote:

"In response to your letter notifying me of the expiration of my gas model license, I would like to say at this time, as much as I hate to, that since I have joined the navy I no longer have need for it and only hope the person that gets it may have all the pleasure from building and flying planes that I had.

"Since I first applied for membership in the Academy, in September 1939, I have been swept by the course of human events into membership to Bar of the State of New York, hence the somewhat imposing stationery. However, I am still a model builder and flyer when my practice gives me time.

"The boy scout troop with which I am connected as a committeeman is at present contemplating the sponsorship of a model airplane contest some time this spring. In order to be more fully cognizant of the details involved in such a venture, I am writing to you for your Contest Manual.

"In the event that the troop (250, Queens) does ultimately decide to go through with this plan, you will certainly hear more from me.

"In closing may I add my very best wishes, and an admonition to the Academy to keep up the good work.—*EDWIN T. CARINE, JR., Long Island City, N.Y.*

"I am, I think, rightfully proud of what the club in Atlanta has accomplished under its last two presidents, namely, Frank Roberts and myself. We have grown from a club of twelve or fourteen members, when R. Roberts took over, to a club of eighty-five or more active members. We have a bank balance of well over a hundred dollars since our last big contest. We have accomplished this on dues of ten cents a week and no entrance fees to join the club, and all of our contests have been for the past year sanctioned by the A.M.A. However, the boys have not shown the interest we thought they would show in night flying or sea plane flying.

"It is the present plan of the club, and I want to now make application, if it is possible, for a sanctioned contest on the first Sunday in every month: January 4, 1942; February 1, 1942; March 1, 1942; April 5, 1942; May 3, 1942; none in June, as June 13 and 14 are already sanctioned as the Southeastern; July 5, 1942; August 2, 1942; September 6 and 7, 1942, as the Labor Day Contest of the Atlanta Aero Engineers; and October 4, 1942, making the twelfth contest. All of these contests will have around 100 entrants, with the exception of the June 13 and 14 and September 6 and 7, which should be classed as AAA meets, since they will have well over a hundred contestants and run into $200 or $300 prize money. The other contests are strictly club contests and the prizes will run at least $20 in merchandise for each of them."—*W. SCHLEY HOWARD, JR., Atlanta, Ga.*

It was with deep regret that Academy Headquarters learned of the death of Dr. Bruce Lorimer, of Milwaukee, Wisc. Dr. Lorimer had accepted appointment as A. M.A. State Councillor only a short time before; this appointment came in recognition of his services to model aviation and the youth of his home state.

Dr. Lorimer, in addition to serving as State Councillor, was a member of the Milwaukee Model Aviation Council and had been active in Exchange Club-sponsored aviation activity.

Our sympathy is extended to his family and friends and we know that model aviation will never find a truer friend.

French's Hobby Shop, of 88 Third Street, Troy, N. Y., wishes to announce that a Super Atom motor No. 11014 was stolen from their shop. Should any information come to light concerning this motor they would appreciate the finder advising them.

A very interesting column by Henry McLemore, a writer for the McNaught Syndicate, Inc., appeared recently in papers throughout the country. As this particular article referred to model airplane building we pass along some of the salient points found in Mr. McLemore's sad story.

It seems that our friend decided to economize by making toys for the neighbors' children at Christmastime instead of buying them completed. Among other items which he purchased were several model airplane kits, and his difficulties with the construction of model aircraft

are repeated here briefly.

"The first thing I tackled was the construction of a Vultee Vanguard U. S. Army type pursuit plane. I got a nasty shock when I pulled out the blueprint that accompanied the parts. It was bigger than a horse blanket and resembled the final examination for honor students at M. I. T. or California Tech. I looked at the box to be sure I hadn't been given the original design for Boulder Dam.

"Knowing that before I mastered the intricacies of this layout, Cousin Fred, aged 9, for whom the Vultee model was intended, would have children of his own and look pretty foolish flying it in a vacant lot. I shelved the project in favor of a Hawker Hurricane. I chose the Hurricane because on its box was plainly stamped 'Simple in construction. Any child can make it.'

"Well, all I have to say is that any child who can is a slacker if he has not quit kindergarten or grammar school and gone to work for the Government in some defense job. His country needs him, because there can't be more than 10 or 12 engineers in the world with enough background to handle its details.

"I went to work on it, nevertheless, but not before vowing that if by some miracle I got it together it would be sent to help the British and not to Nephew Frank for pleasure flying around Alabama.

"The design and parts for the Hawker Hurricane cost me 50 cents. I could have bought a shiny, new assembled one for $1.25. Up until now my economy wave on this toy alone has cost me around $15. The card table, which I turned into a workbench, was the first item of expense. I was whacking away at a propeller when the knife slipped and almost cut the table in two. A pair of scissors (the only decent ones in the house) fell apart on a wing job and a dozen new razor blades have gone into the whittling of the fuselage. A suit of clothes is all but ruined by rubber cement spots, and there is no telling how much iodine and bandages I have used in repairing cut fingers.

"What work I have done has been accomplished under difficulties.

"There have been open threats of sabotage from the neighbors who object to living next to an industrial plant which they say is the most profane in history.

"Danger lurks even closer. There is a Fifth Columnist right under my roof who is just waiting her chance to take the broom and sweep the whole works into the fireplace. She maintains that if the parents of the youngsters who are going to get the toys only knew the language that is going into the building of them they wouldn't allow them to handle them without gloves."

We have never heard a stronger case for the abilities of the model airplane builder than Mr. McLemore presents in the story of his attempts to build a model airplane. We think that if we could get Mr. McLemore to tell his story to Federal officials model aviation would soon be recognized as an essential defense activity.

ANNUAL REPORT

Flying Scale Model Committee of the Academy of Model Aeronautics

The committee, after studying and evaluating the suggestions of the model airplane leaders in the various sections of the United States, agreed unanimously on the 1941 Flying Scale Model Rules, which were submitted to and approved by the Academy of Model Aeronautics. We feel that the 1941 rules will give an impetus to authentic flying scale model airplanes and discourage "dressed up" cabin model airplanes. Reports from the various sections of the country show that flying of scale model aircraft is on the increase.

The rules have been enthusiastically received and the committee at this early date has received commendation from the Southern California Gasoline Model Airplane Association, Chicago Park District, the Aircrafters, Aero Club of Pennsylvania, Philadelphia Model Aeroplane Association, and the Advisory Committee for Model Aeronautics.

The committee acknowledges Messrs. R. J. Hoffman, Steve Meuris, John Rappold, and Maurice Roddy for their practical suggestions for the 1941 Nationals. As a matter of record the chairman sincerely appreciates the prompt and efficient responses of Walter S. Eggert and Thomas D. Wildon to the business of their committee. The committee desires to thank Albert L. Lewis, Executive Director, and Bruno P. Marchi, Chairman, Contest Board of the A.M.A., for their consistent and whole-hearted cooperation during the past year. The committee wishes to express its gratitude to President Edward Roberts for being given the opportunity to work with him and the A.M.A. in serving the youth of America.

Recommendations of the Committee are:

1. Hold an Indoor Flying Scale Model Event in addition to the Outdoor Event at the 1942 Nationals.

2. Publish in the A.M.A.'s monthly news bulletin authentic three-view drawings applicable to Flying Scale Models.

VICTOR R. FRITZ,
Chairman.

REPORT OF ACTIVITIES

Photographers and Artists Division Public Relations Committee of the Academy of Model Aeronautics

The Academy of Model Aeronautics is

furthering its service to model aviation through the activities of its various committees. The Photographers and Artists Division is one of this group. Since there was no opportunity for this division to function officially during the past year, a brief survey can be made of the opportunities which exist whereby this division can become active in the future.

Insofar as the impression made upon the general public, including many potential model aviation enthusiasts, this depends a great deal upon what they see in the form of photographs, drawings, diagrams, posters, etc., relative to model aviation, a program to improve the quality of material of this kind will no doubt be beneficial to the activity in general.

Although the publicity of the more important model events is usually handled by persons of competence, in the planning of smaller events the model builders themselves are frequently called upon to furnish photographs or otherwise assist those in charge. In such cases, any practical suggestion furnished by the Academy of Model Aeronautics through the Photographers and Artists Division would be of value. This might be in the form of a pamphlet covering all aspects of photography and art work as it relates to contest publicity.

The various publications have always played an important part in model aviation. It is possible that in some way the Photographers and Artists Division might be of assistance to the less experienced contributors to the model sections of these publications. Technical advice dealing with composition, human interest, contrast, and other factors would improve the quality of photographs, while data on scales, proportions, requirements for reproduction, etc., could likewise make working drawings and illustrations more comprehensive.

If for no other reason than as a gesture of appreciation this effort to indirectly assist the publishers of the model magazines would be entirely worthwhile.

These ideas may or may not materialize, but they do illustrate a few of the several possibilities whereby the Photographers and Artists Division of the Academy of Model Aeronautics can become active in serving model aviation.

H. A. THOMAS,
Chairman.

VICTORY

A Record Indoor Fuselage Model

(Continued from page 24)

riety. It is merely an extension of the fuselage, built of same material.

Stabilizer: The stab is constructed on a full size plan. The four spars are cut from 1/32" sheet tapered to 3/128". Round spars and soak in water for 5 minutes. Pin on outlines and fix on the tips. The ribs are sliced from 1/64" sheet with the use of a template. They are then cemented to the leading edge and when cement is dry the rear of the ribs are cut for taper and cemented.

The stab is covered with blue or light green film. Saliva is used to adhere framework to film.

Rudder: Constructed same as stab; the same dimension ribs are used.

Landing Gear: Cut from 1/32" sheet and tapered from 1/32" x 1/16" to 1/32" sq. x 7".

Wheels: Are of horse hair, formed around any object of one inch diameter. If you don't know any horses, well—. The axle is of 1/64" rounded bamboo.

Wing

Spars: The wing spars are sliced from 3/64" sheet wood, 11" long tapering to 1/32". Round the leading edge before cutting them from the sheet. The remaining sides of the spars to which the ribs are cemented remain flat. The final cross section is 3/64" x 5/64" at the center joint tapering to 1/32" at the tips. The four spars weigh .005 oz.

Ribs: Select a quarter-grained sheet of slightly under 1/32" thickness. Sand this sheet to about 3/128" and slice ribs from this using a template of cardboard or aluminum.

Wing Tips: Several methods of bending wing tips are excellent, however, we will outline a method used for the past seven years, which, naturally, we believe to be best.

Simply secure your mother's best teaspoon and cave in the sides with a pair of pliers, thus giving the spoon a half-round crossection. Then invert and heat over candle. While spoon is being heated, cut tips out of minus 1/32" sheet and place them on a folded handkerchief (the best in the house) that rests on the palm of the left hand. Wet the tip wood, and press the hot spoon against the wood and work into shape. If you have a strong will power you can dispense with the handkerchief, since it is only for protection.

If you're left-handed, why just change hands.

The ribs are attached to the spars with a minimum of cement. For best results draw a full size outline on a drawing board or similar substances.

For covering the wing use a hoop sufficiently large enough to cover the entire unit. After the wing is completely dry, remove from the film by trimming with a hot wire. Be sure to trim around the outside of the outline. (????) Dihedral is then cracked in and cemented. The loose film that results from placing in the dihedral can be tightened either by heating with a cigarette (a commercial could be here) or anything that supplies heat, or by tracing a dripping wet strip of wood along each side of the center rib. Last but not least cement the clips on noting that they give the proper wash-in on the left wing half. (Leading to trailing edge.)

Propeller: The propeller should be carved from approximately 4/lb/cu.ft. wood.

Refer to the article by Carl Goldberg in the January, 1938, issue of MODEL AIRPLANE NEWS for proper carving procedure. Carving time may be cut to a minimum by using a sandpaper block, and sanding blades on a large tumbler or a half-gallon mason jar. In that case always sand from the sub; never sand to and fro.

Adjusting and Flying

Front to rear, the stabilizer is set at zero degrees. The left half is washed out about 1/16" and the right half is washed in about 1/16". This setup takes care of the enormous torque liberated at the initial burst. Warp in wash-in in the left wing until ship flies on an even keel.

Thirty-two inches of 5/64" brown rubber looped and tied using a square knot should provide sufficient thrust if weight was religiously followed. However, if ship does not ascend readily, by all means use 3/32" rubber. (If plane can stand additional strain.) Varying the amount of wing incidence will govern glide.

If plane flies well with 800 turns, wind in 1200 turns and pray. Since structure is quite sturdy, you will have little difficulty with twisting surfaces.

VICTORY

Calling All Engineers!!

(Continued from page 8)

to the factory. In these days of priority requirements by the Federal Government, the task of this group is manifold. Each group and project engineer must be informed of any change in specifications of parts, availability of substitutes of purchased parts if necessary or price change. All drawings that pass through this group must be posted with the finish, heat treat and normalizing specifications. Finished parts and samples are also inspected when the necessity arises. The group also serves as a focal point for all information relative to outside vendors, purchasing and production is gathered and distributed to the interested individuals. A complete file of the AN Standards and Specifications is maintained. An engineer assigned to the material control group must have a general knowledge of all the material and parts incorporated in the airplane, parts purchased from outside vendors and the various production processes. In short, this is the kind of assignment that promotes the growth of gray hairs on young heads.

The planning engineer thinks in terms of curves and graphs plotted on coordinate paper. The planning group is small. Estimates are made of all the necessary time required to engineer present and future projects. A running account of each project's progress is computed. Knowledge of personnel requirements, shifting of personnel and accounting relating to time expenditure are essentials for this job. Engineering planning lacks the appeal, however, of design work of direct or indirect nature.

The records group is a "jack of all trades." This clerical group is responsible for release and distribution of all blueprints to the factory, technical reports, catalogs and restricted data. The files, drawings in the vault and distribution of project slips are other duties assigned to this group, plus the general layout and disposition of engineering equipment and issuance of engineering supplies. Engineering budgets for material are prepared by the records engineer.

Aerodynamics! This work appeals to the technical engineer. This group prepares

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Complete kit .....$3.95 p.p.

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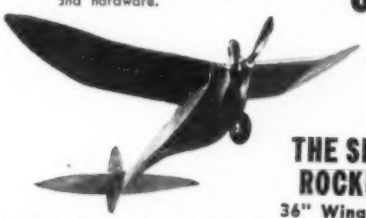

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27" Wingspan
Super streamlined, this ¾" Scale VULTEE is a ship that you know will perform in the air like a real plane. The kit is complete for
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A model that is an exact ¾" scale duplicate of its prototype. The finished model is sleek and neat and can't be beat for performance in the air.
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You're off to new records and better performance with this graceful ship. The propeller retracts into the fuselage when the rubber band motor unwinds, reducing wind resistance in the glide. Kit is complete with metal fittings ready-made less rubber.

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Another Henry STRUCK design. This tow-line launched glider equipped with Spiral Control is capable of unbelievable accomplishments. The simplicity with which you can launch makes Sinbad a real contest winner! The ease with which you can build the ship will amaze even the most experienced builders. Complete kit.

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aerodynamic investigations necessary to prosecute the design of a new project. Control, performance, stability, wind tunnel models and testing rigs are investigated. Wing and tail flutter, and vibration prevention are analyzed so that the new project will comply with C.A.A. requirements or meet military design specifications. The aerodynamists act as consultants to determine major dimensions, cross sectional shape and engine installation. Engine cooling tests are also conducted by this group.

The stress group determine the basic loads imposed upon the structure, load factors and the resulting stresses developed in the structure when the loads are imposed. The locations, size, shapes and margine of safety of all structural members are determined. The cable tensions necessary for rigging purposes are also established. Static testing is conducted under the supervision of the chief stress engineer. The stress group works in close collaboration with the design groups and aerodynamists. Stress engineers dwell in a realm of figures and brute facts, but even though modern airplanes are complex organisms, the basic fundamentals of strength of materials still apply.

An engineer who can sketch and draw in a fluent style and who is an able technician will find an interesting assignment in the preliminary design group. A combination of a Norman Bel-Geddes and a versatile aeronautical engineer may be established as the basic requirements for preliminary design work. This group may contain specialists of all kinds, technical illustrators and stylists. Preliminary designs and estimates are prepared by this group.

The weight control engineering group visualizes the airplane in terms of excess weight, or shall we say, the maximum strength to weight ratio. Weight control work involves a running weight tally during the course of fabrication of all airplane parts, prior to and during assembly. The airplane structure is appraised for equipment designs of light weight, and recommendations preaching weight economy are issued to the design groups. Buoyancy and flotation estimates are also prepared by this group, in addition to loading charts for loads distribution. All weighing operations of the finished airplane are made by this group.

The specifications group is all the name implies; this group prepares all project specifications of sale or manufacturing nature describing performance, styling, size, armament, military load or payload. The specifications must be constantly revised because of revisions of design; they must also be written with sufficient latitude to allow substitutions of parts without necessity of altering the basic airplane or its performance. This group works in harmony with the engineering departments' design groups and the service department. This job is no sinecure; an ability to write clear and concise reports in good grammatical style is a requisite.

A shop liaison engineer functions as messenger between the project engineer and factory. An inconsistency on a drawing submitted to the factory must be reported and corrected by the draftsman; the necessary project slip and engineering order is issued to cover the drawing change. All records relative to the changes are kept by this group.

The production engineering group appraises all layouts for design efficiency relative to tooling and shop production. Changes are recommended to the design groups to facilitate or lower production time and cost, and yet speed up tooling operations. New fabrication methods are being constantly investigated by this group.

The service engineer may be classified as a "technical" Swami for airplanes. In order to prepare all handbooks pertaining to the airplane's operation, repair and maintenance, an intimate knowledge of the airplane and its construction must be obtained. Service bulletins are issued to customers to correct minor service faults. Details of special rigs to facilitate servicing are also prepared and furnished to customers. All records of service nature are compiled by this group. A thorough knowledge of the Air Corps Technical Orders serves as a basis of the necessary experience. A requisite for work of this nature is the ability to be "service" minded and prepare reports in clear concise grammar and technical description. This group also check the design of special parts for service.

We have now explained what work the various groups in a large engineering department undertake. Design work is very interesting, nevertheless, the work of the other groups not involved in design work offers the typ[illegible]ngineer an interesting field of endeavor. While each plant operates the engineering department on a different basis, all plants mor or less follow the general pattern outlined here. Company organization may vary and jurisdiction or assignment of some specific group may be different than explained, but in any event, the Lord High Executioneer, The Project Engineer, . . . satisfy him, and your job is assured.

VICTORY

Build and Fly the Miles Magister

(Continued from page 17)

The nose block is cut from two pieces of 1/4" sheet cemented cross-grain; cut out the square hole for the nose plug, then roughly cut to shape and cement to the fuselage. When dry, cut and sand the entire nose to a smooth, attractive shape.

Tail Surfaces

Construction of the tail surfaces is easy and both the rudder and stabilizer are constructed in a similar manner. For greatest strength the stabilizer is made in one piece so make a full size plan. Outlines are cut from 1/16" sheet and the spars are 1/16" x 1/8"; ribs are 1/16" sq. strips. When dry, remove the frames from the plan and soft pieces of 1/16" sq. cemented to both sides of the ribs; cut to a streamline shape when the cement has hardened. Trim and sand the surfaces to final shape.

Wing

The wing is made in three parts; plans for the right wing and half of the center section are given. Prepare a full size plan of the left wing and whole center section so the various parts can be assembled over them. Two of each type rib with the exception of No. 1 are required; all are cut

from 1/32" or 1/20" sheet. Notches for the various spars must be cut with accuracy to insure a neat job. Leading edges of the outer sections taper as shown by broken lines. Taper the trailing edges to correct cross-section before pinning them to place over the plans. Assemble the parts right over the plans using pins to hold them in place until the cement is hard. Tips cut from 3/32" sheet should be cemented to place. Trim the edges and tips to shape, finish with sandpaper and then solidly join the three units together with 2 1/8" dihedral at each tip.

Landing Gear

Landing gear struts are bent from .040 music wire which is bent so as to join the spar provided for that purpose and rib No. 1. Be sure to make a right and left strut and then attach them to place with thread and plenty of cement. Use a needle and thread to sew right through the ribs and around the wire. Apply several coats of cement to the entire adjacent area. The rubber tubing covers are not added until the wing has been covered.

Make the wheels from laminated discs of balsa or they may be bought. Cement bearings to the sides so they revolve accurately and smoothly.

Propeller

For best performance any flying model must have an efficient propeller. Select a hard block 1" x 1 1/2" x 8 1/2" and cut the blank to the shape shown. Drill the tiny hole for the prop shaft then start to carve a right hand propeller. Finish the back surface of the blades first, then cut away the front to the desired thickness. Round the blade tips similar to the prop in the photos. Use rough and then fine sandpaper to smooth and balance the blades. The spinner is made in two individual pieces cemented to the sides of the hub. A free-wheel device should be attached to improve the glide and a bearing is cemented to the back so the prop will revolve smoothly. Apply several coats of clear dope with light sanding between each and then color dope to a nice finish.

The removable nose plug is shown. A disc of 1/32" plywood forms the front while the back is laminations of hard sheet balsa. Flight trials of the test model indicated that several degrees of both right and down thrust are desirable so this can be incorporated in the plug at this time. Fix the thrust line by cementing washers to the front and rear of the plug.

For the propeller shaft use .040 music wire. Place several washers between the prop and nose plug before bending a loop in the end into which a winder can be hooked.

Covering

Before the frames are covered, carefully sand to remove all flaws and roughness. Either colored tissue or light grade Silkspan may be used; we like the appearance of tissue best but it requires numerous pieces on curved parts to prevent wrinkles. Cover the fuselage first with light dope or banana oil for adhesive; also the sheet balsa nose is covered with tissue. Use an individual piece to cover the top and bottom of each wing section and the tail surfaces. Spray the various parts lightly with

RADIO CONTROL

No. 151—RCH Sequence Solenoid. One of the special devices developed by Radio Control Headquarters is the novel Sequence Solenoid—a species of mechanical sequence relay, which provides uni-directional two-position control of low-torque devices such as model engine throttles, etc. The range of its possible uses is almost limitless—bomb and parachute release, flap or landing gear control, sail-shifting or anchor release on model yachts, turning bells, whistles, lights on and off, etc., etc. A simple toggle mechanism gives two positions of the armature on alternate pulses—left, right, left, right, etc. The torque available is limited to 4 oz.—in. Two to six flashlight cells power the solenoid. Dimensions: 2" x 4½" x 1". Weight: 2 oz. Price: $5.75.

Ask your dealer or send 25c for Illustrated Instruction Manual.

Radio Control Headquarters
330 WEST 42ND ST., NEW YORK CITY

The large propeller gives long flights, while cockpit and decorations give a realistic touch

water to tighten the covering but clear dope is not applied until the model has been assembled.

Assembly of the Miles Magister is simple. First fit the wing into the recess in the fuselage and cement firmly. If parts have been built with accuracy, the angle of incidence will automatically be correct. Finish the section from wing to fuselage with small pieces of 1/16" sq. Wing fillet shape on the original model is shown; cut a paper pattern of it to fit the model exactly before cutting two from 1/32" sheet. If the builder desires, he can cut wing root pieces from 1/16" sheet to the shape of the rear of the fillet and cement them between the fuselage and wing to support the back of the fillet, though hardly necessary. Once cemented to place the fillets are covered with colored tissue as is the uncovered portion under the wing. The stabilizer is attached to the top longeron at the angle shown. Off-set the rudder about 1/16" for a right turn in the glide. Check and recheck everything for correct alignment. When dry, tissue fillets are attached between the stabilizer and rudder. Moisten any covering wrinkles with water and dry before brushing one or two light coats of dope on the entire covering.

The model can not be considered complete until numerous minor details are added. Rubber tubing of the correct diameter is slipped over the landing gear wires and then doped back. (This tubing can be obtained from any model supply house, or can be stripped from many electrical appliances.) Wheels are colored before being fastened by washers soldered to the axles. Two windshields are cut from celluloid; if thin black tissue strips are doped to the surface to represent a frame, realism is increased. Carve a headrest from soft balsa and cover with tissue to match the fuselage covering. The tail wheel, exhaust stack and similar items are made from scraps of balsa. The British insignia is found on the wings and fuselage sides of the real plane, and can be made from colored tissue. Control surface outlines, cowl openings, identification markings and similar details are made from tissue also.

Our model is powered with either six strands of 3/16" rubber or ten strands of 1/8" flat, brown rubber. Hook the motor to the propeller shaft and then drop the other end through the fuselage. It may be necessary to remove a small section of the covering in the rear to get the strands, held by the removable bamboo pin, into position. The model Miles Magister is now ready for initial flight.

Flying

The secret of obtaining fine flight from a properly designed flying scale model is simply great patience. It is indeed highly improbable that your model will fly perfectly on its first flight. Before actual tests are begun, the model should balance when held at about 1/3 the wing chord; addition of a small weight to the nose or tail makes this correction. Check glide the ship, warping the back of the stabilizer down a bit to iron out a stall or warping the back up to correct steep glide. Hand launch over deep grass or weeds observing in particular the glide and making any necessary adjustments. When a good glide has been obtained, perfect powered flight by offsetting the thrust line with slivers of wood between the nose plug and nose. Increase the number of turns as flights improve. Treat the model with care until its flight characteristics are learned then try long flights—and you can really get them with the Miles Magister.

VICTORY

Bomber Buster

(Continued from page 14)

retractable landing gear.

FUSELAGE: The fuselage is of full monocoque construction built in two halves (upper and lower) joined along the profile centerline. The forward half consists of the pilot's quarters, his controls and instruments. The rear half houses the baggage compartment, accessory equipment and tail gear. The fuselage is built up on a framework of 13 bulkheads joined by longitudinal stringers and covered by Alclad aluminum alloy sheet riveted to the framework. Large cutouts are provided for the wing, tail wheel and cockpit, suitably reinforced with stiffeners. These two-halves speed production time, the lower being trundled under the upper and the completed shell moved on along the production line.

WING: This is divided into four sections consisting of two main panels and two wing tips. These main panels are joined at the plan centerline of the fuselage through use of heavy bolt angles, bolts and nuts. The wing tips are secured by a series of screws which may be removed easily for inspection and assembly. The lower portion of this bolt angle is removed to accommodate the large removable fuel tanks, supported inside the wing by conventional padded straps. Construction is a multi-spar-intercostal design with main spars built up of a single sheet web punched for lightening holes capped by riveted channels constituting a light "I" beam. Ribs are stamped aluminum sheet, flanged and cut-out lightening-holes. Beads and riveted stiffeners give added strength. A high speed thin-section airfoil is used and comprises an aluminum Alclad sheet covering over extruded section stiffeners laid laterally. Cutouts are provided in the wing skin for landing gear wheel wells, fuel tanks, machine gun installation and cartridge containers, inspection plates and covered hand-holes. Flaps extend between the ailerons, consisting of flat sheet riveted to half-ribs, hinged at their leading edge. Ailerons are all metal construction fabric covered and fitted with small trim tabs. They are statically and dynamically balanced through use of lead weights bolted into the over-hanging leading edge forward of the hinge centerline. The fuselage is lowered onto the wing and bolted into place through bolt angles attached to the wing. The wing to fuselage joint is covered with large sheet fairing strips riveted to suitable contour ribs which extend from the fuselage bulkheads.

LANDING GEAR: Landing gear consists of two main forward wheels and a single tail wheel. The forward wheels are supported on cantilever air-oil shock absorber legs. Retraction moves these legs rearward and a pair of right-angle bevel gear plates rotate the leg through ninety degrees to cause the wheels to lie flat inside cutouts in the wing undersurface. They are smooth contour types, hydraulic brakes are provided. Two small plates close over the leg forward portion to reduce drag. In order to place the landing gear centerline as far forward as possible, two small perispheric housing project forward of the

wing leading edge covering the landing gear support plate and fitting. The tail wheel is fully retractable and is covered in flight by two clam-shell doors which fold over the opening after retraction to seal it. Both mechanical and visual position indicators and warning lights are provided for the pilot within the cockpit.

POWER PLANT: The P-40 series is powered with an Allison V-1710-C15 twelve cylinder "V" liquid-cooled engine with a maximum normal rating of 840 horsepower at 2600 r.p.m. at sea level, 960 hp. at 2600 r.p.m. at 12,000 feet and 1090 hp. at 3000 r.p.m. at 13,200 feet. Maximum normal of 960 @ 2600 @ 12,000 is used for cruising and maximum permissible power for takeoff is 1090 hp. at 3000 r.p.m. at 42.9 inches of mercury manifold pressure. This model has a gross weight of 1340 pounds. The P-40D series is powered by an Allison V-1710-E4 engine developing 880 hp. at 2600 r.p.m. at sea level and 1150 at 3000 r.p.m. at 12,000 feet. Cruising power is 1000 horsepower at 2600 r.p.m. at 10,800 feet. Maximum permissible takeoff power is 1150 hp. at 3000 r.p.m. at 45.5 inches of mercury manifold pressure. This engine weighs 1400 pounds gross (dry) and has a specific fuel consumption of .62 lbs/b.h.p./hour and a specific oil consumption of .025 lbs/b.h.p./hour. The P-40F, latest in the series, is powered by a Rolls-Royce "Merlin" engine V-1647-II which develops 1040 hp. at 2600 r.p.m. at 2500 feet and 1145 at 3000 r.p.m. at 5250 feet. The two engines are, thus, almost identical in volume, power and design. The Merlin is being built in this country by both the Packard and Ford concerns under the Lend-Lease Act, and large quantities are now in mass production. Recent statements, as yet wholly unconfirmed, indicate the P-46 is powered by an improved Allison engine fitted with a turbine exhaust-driven supercharger giving nearly 2,000 horsepower at 18,000 feet.

The engine mount consists of a forked welded steel tubing structure flattened at the ends and bolted together with the engine mounting flange plates. The oil tank has a capacity of 16.5 gallons and is mounted aft of the engine against the fire-wall above the carburetor. The oil cooler is located below the engine within the radiator cluster. This is composed of three individual core-type radiators mounted with their axis parallel in a small circle. The other two radiators cool the ethylene-glycol fluid, the engine coolant, each radiator accommodating an individual bank system. A small header tank introduces fresh fluid into the system to replace that evaporated or lost through leakage. This entire cooling system is fully automatic. The fuel system consists of three tanks, two below and one within the fuselage aft of the pilot's head-rest. A large fairing assembly covers the tank pumps and emergency fuel supply mounted below the fuselage, giving the P-40 series its peculiar "under-slung" appearance. Total fuel capacity is 160 gallons in the P-40D increasing the 120 gallons used on the standard P-40 types.

The propeller is three-bladed all-metal electrically-controlled Curtiss design of constant speed control. It is gear-driven by the engine through a reduction gearing of 2:1 indicating propeller rotation at only one-half the engine speed; i.e., at 3,000 r.p.m. propeller running at only 1500 r.p.m.

The down-draft type carburetor and air is taken from a point just aft the propeller and conducted aft through a duct and down into the carburetor. Air can be heated when required for high altitude or cold weather operations.

The radiator cluster is fully enclosed in a huge streamlined housing beneath the fuselage opening at the forward end into a large air-scoop. The aft end of this housing is fitted with hydraulically controlled cowl flaps which regulates the pressure drop across the radiators, insuring adequate even cooling throughout the full range of operating speeds and temperatures.

ACCOMMODATIONS: The P-40 series throughout carries a complete list of equipment about 50% greater than that carried by foreign pursuit planes. A Command Set including receiver, transmitter, dynamotor, switch box and head phone set is fitted for adequate radio communications between planes and between plane and ground station. Complete oxygen equipment is carried including flask, pressure regulator, flow-meter and pilot mask. A flare pistol is mounted on the cockpit right side with six flares carried in a small container adjacent to the holster. A life preserver is fitted to the back of the pilot's seat. The seat is adjustable through a range of nine inches. Complete engine and navigation instruments are carried including exhaust-fuel analyzer, artificial horizon, pilot tube heating equipment, gyro compass and map case and container in addition to standard altimeter, airspeed, rate-of-climb, turn-and-bank, cylinder head temperature, fuel and oil pressure, tachometer, etc. The baggage compartment carries the engine starter crank, first-aid kit and a small bag of emergency tools. There are provisions for carrying 125 pounds of baggage within this compartment, also for plugging in electrically heated equipment, pilot's flying suit, helmet.

TAIL SURFACES: The vertical and horizontal stabilizers are all-metal built up on a structure of spars and ribs reinforced with stiffeners, the whole covered with riveted aluminum alloy sheet. The rudder and elevators are similar construction covered with fabric. Each of the latter have small trim tabs controllable in flight.

ARMAMENT: The early P-40 types carried in the nose two fixed .50 caliber Browning electrically controlled machine guns synchronized to fire through the propeller and two .30 caliber free-firing Browning machine guns mounted in each wing panel. These wing guns are electrically controlled through solonoids attached to each gun and may be fired in pairs or in salvo (all together). The P-40D carries the same armament with exception of .50 caliber wing guns replacing the .30's formerly used. The P-40F and the XP-46 carry an additional gun in each wing panel making a total of 6 machine guns in the wings and two in the fuselage. The British versions, the Tomahawk and Kittyhawk, carry racks for six light bombs, three on each wing panel.

ARMOR PLATE: The P-40 series carries two plates of armor, a small one forward of the pilot under the cockpit cowl

GRUMMAN F3F1
U. S. NAVY SHIPBOARD FIGHTER

32" Span. Length 24". 1" Scale

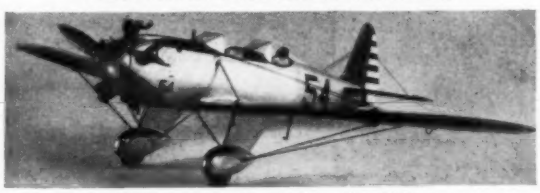
A fine detailed model with retractable landing gear, 4" turned balsa motor front, 3 oz. grey dope, ½ oz. yellow, 2 oz. glue etc., all parts printed on balsa, 10" propeller, wheels, rubber motor, full size drawing, and all parts. This fighter plane is used in large numbers on the aircraft carriers. Const. Set complete, postpaid. **$3.75**

CURTISS HAWK F11C4 PURSUIT NAVY

32½" Span. Length 22¼". 1" Scale. Weight 6 oz. Color grey, top wing yellow

THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVEABLE CONTROLS WORK FROM COCKPIT. A special de luxe model, one of the most beautiful ever made. Set contains a 4½" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4½" aluminum cowl, 10" steel type carved prop shown, 2⅛" wheels, tail wheel, star and rudder insignia and lettering, rubber, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walks, ready cut wheel pants, washers, 3 oz. grey paint, ½ oz. yellow, ½ oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood 33"x44" scale drawing. Const. set, complete in labeled box, postpaid..... **$4.50**

NEW RYAN PT21 ARMY TRAINER



30" Span. Length 23". 1" Scale. Weight 3 oz.

A special feature of this model is its fuselage, which is completely covered with sheet balsa, then with tissue—giving it a beautiful appearance. Model has movable controls from cockpit. Set has all parts printed on balsa, set of paints, rubber, wheels, full size drawing, etc. Set, postpaid..... **$3.00**

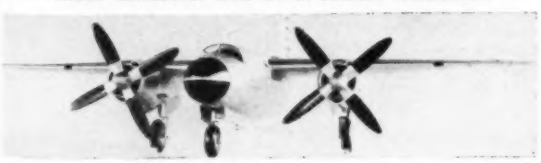
BOEING B-17 FLYING FORTRESS BOMBER

44" Span. Length 30". Color, silver. Weight 6 oz.

Set has all parts printed on balsa, four 2" turned balsa motor fronts, four 4" carved props, celluloid wheels, set of paints, glue, and full size drawing. Set, postpaid..... **$4.50**

De luxe set with 4 aluminum cowls, 4 celluloid motors, 4 metal props, and 2 M & M air wheels. Set, postpaid..... **$6.25**

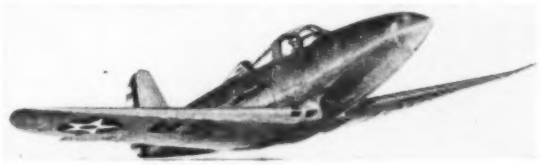
NEW MARTIN B26 U. S. ARMY BOMBER



40" Span. Length 35". ⅛" Scale. Color silver

A beautiful model of the world's fastest bomber. Set has all parts printed on balsa, propellers, wheels, insignia, set of paints, glue, full size drawing, and all parts. Set, postpaid..... **$4.75**

NEW BELL P39 AIRACOBRA PURSUIT



34" Span. Length 30". 1" Scale. Color silver.

Exact in every detail of the real plane. This is the most perfect copy of the P39 on the market. Set has all parts printed on balsa, 3 oz. silver dope, 2 oz. glue, black, etc., turned wheels, insignia, rubber, carved propeller, full size scale drawing, and all parts. Set, postpaid..... **$3.50**

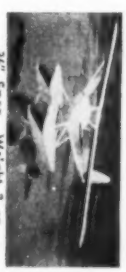
9 FOOT TAYLORCRAFT GAS MODEL

Set has ready cut wing ribs, gear struts, nose piece, etc., set of paints, dope, glue, etc. Model weighs 3⅝ lbs. without motor, suitable for radio control. Lifts 4 lbs. additional weight. Full size drawing. Const. set, postpaid, less wheels and motor..... **$15.00**

SEVERSKY P35A ARMY PURSUIT

32" Span. Length 25". 1" Scale. Color, Silver

Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, ½ oz. black, 2 oz. glue, etc., insignia, and full size scale drawing. New improved model has retractable landing gear and movable controls from cockpit. Set, postpaid..... **$3.25**



36" Span. Weight 2 oz.

Land and seaplane set. 1" Scale. Includes paints and all parts. Set, postpaid..... **$1.50**

BOEING F4B4 NAVY FIGHTER

22½" Span. Length 14½". ¾" Scale.

Set has 3" celluloid motor, 3¼" tapered aluminum cowl ring, set of paints, etc. Postpaid..... **$2.95**

CURTISS F11C4 SOLID MODEL

10½" Span. Length 7½"

This is a special de luxe solid model. Set has completely finished balsa fuselage, cockpit cut out, routed pants, wings cut to shape, 1⅛" de luxe cast motor, alum. cowl, 3 bladed cast prop, paints, drawing and all parts. Set p.p..... **$1.50**

NEW! 1942 CATALOG 10c

CURTISS P36 ARMY PURSUIT

37" Span. 1" Scale. Color, silver

Set has turned motor front, set of paints, glue, all parts printed on balsa, and full size drawing. Set, postpaid..... **$3.25**

Set with 4" celluloid motor and aluminum cowl, postpaid $4.25

NEW CATALOG

No. 7—1942

has large 6" photos of the world's finest scale flying models, gas motors, solid models, etc. 16 pages. Size 7½" x 9½". Don't miss it. Send 10c coin today.

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MINIATURE AIRCRAFT CORP.

83 DANIEL LOW TERRACE STATEN ISLAND, N. Y.

and a large one aft of the seat running the entire fuselage height. This armor plate is special case-hardened steel designed to stop bullets up to .50 caliber and deflect shells from 23 millimeter to 37 millimeter cannon mounted on enemy planes. The forward plate weighs approximately 50 pounds and the rear roughly 125 pounds.

AUXILIARY SYSTEMS: Operating mechanisms are all hydraulically controlled by hydraulic operating struts for the landing gear, tail wheel, cowl flaps, wing flaps and wheel brakes in an independent system. The hydraulic fluid reservoir is mounted within the pilot's compartment and has a one gallon capacity. Pressure is maintained throughout the system at 1,000 pounds per square inch, operation being controlled by the pilot's hydraulic system positioning levers. Relief valves open to relieve pressure when various operating units have reached maximum position.

A 12-volt electrical system is operated from the battery located just forward of the firewall within the powerplant compartment. All lighting including navigation and signal lights, cockpit instrument lights and the radio dynamotor is run from this source. A vacuum system operated from an engine-driven vacuum pump operates the gyro instruments.

PERFORMANCE: The earlier P-40 series had a top speed of 330 miles per hour at 3000 r.p.m. at 15,000 ft. and a cruising speed of 285 m.p.h. at 2600 r.p.h. at 10,800 ft. An experimental P-40 model has attained a top speed of 292 m.p.h. on a short test run. The newer P-40D has a maximum speed of 362 m.p.h. at 3000 r.p.m. at 15,000 ft. and a cruising speed of 305 at 2600 r.p.m. at 10,800 ft. The P-40F with the Merlin engine has a slightly higher speed and the P-46 is expected to fall in the 400 plus class at a high altitude. The P-40D series has a cruising range of 945 miles, the earlier models 893. The P-40D can climb to 37,800 ft. as compared with the 34,500 ceiling of the earlier models. The P-46 will have a ceiling of greater than 40,000 ft.

Unlimited production contracts were awarded aircraft firms under the Lend-Lease Act with one-half the total going to the Royal Air Force and the remaining to the United States Army Air Forces. Curtiss is now producing nearly thirty Hawk pursuit planes every working day which means 300 per month. Thus it will be only a matter of a few months until a sizable quantity of these ships are in full strength squadron service.

But now that we are at war the demand for more speed, greater range and more terrible fire power will increase week by week and there will be no rest for the Curtiss experimental design and testing staff. Later and better models of the P-40 and P-46 designs will be issuing from the many factories of this, the largest aircraft firm in the entire world, all pointing towards the ultimate out-numbering of enemy fighting strength and quick victory for democracy, for which we all strive. If men and machines mean anything, the Curtiss Company is shortening Axis power and conquest.

Build a Model Curtiss Hawk

For you detail hounds, here is the answer to your patience for a ship with all the class and zip of America's latest single seat pursuit plane. The plans can be enlarged by photostating to any required size. Select a good grade of straight grain balsa and cut to overall fuselage dimensions with a band or hand saw. Trace on the fuselage side and top views and cut to rough shape. If these outlines have been sliced off, retrace them again and apply a rough grade of sandpaper to smooth into shape; then use progressively finer grades until a smooth contour results.

Now paint this the dull olive-drab of the United States Army Air Forces or the brown-green upper surface and light blue lower surface of the R. A. F. version.

Cut the wings to shape and sand as above. Paint and allow to dry after which the aileron hinge-lines may be applied with black India ink. Cut the tail surfaces to shape and sand into symmetrical sections. Apply, making certain that they are located at exact right angle to the fuselage and to each other. The landing gear is carved from a single length of round balsa or bamboo wrapped with tiny lengths of paper at the appropriate points. Wheels are best purchased but if required size is not available, cut out of balsa, sand down and paint black.

The propeller should be made in three parts and glued to the spinner, which is best turned out on a lathe. Each part should be painted before assembly, taking care not to paint portion which will contact other parts. After model is assembled, re-touch joints with paint. Apply purchased Army star-and-circle insignia and apply on each side of rear fuselage and on the wing as follows: upper port side, lower starboard side. After assembly spray model with a coat of clear lacquer, more if desired. Now install cellophane cockpit enclosure and aerial wires and your model is complete. We hope you'll be proud to send photographs of it to MODEL AIRPLANE NEWS, 551 Fifth Ave., New York City. Watch for them in coming issues.

VICTORY

Model Designing Simplified

(Continued from page 7)

a general layout of the plane has been made. When the latter has been established the detail design of each separate part will be considered. From experience it shows this to be the most satisfactory manner of procedure and requires the fewest number of erasures or changes in design.

Now we are ready to proceed. First assemble in table form the complete aeronautical data for ready reference; this forms the basis of the layout measurements. Such a table follows:

Weight, (W) = 23.20 oz. (min.)
Area, (A) = 432 sq. in. (max.)
Span, (S) = 56″
Chord, (C) = 8″
Aspect Ratio, (Ra) = 7″
Moment Arm, (M) = 24″
Nose Length, (N) = 8″
Stab Area Raked Tips, (As) = 144 s. in.
Enclosed Area Sq. Corners, (1.15 A_s) = 165 sq. in.
Stab Aspect Ratio, (Ras) = 3.5″
Stab Span, (S_s) = 24″
Stab Chord, (Cs) = 6 7/8″
Stab Angle, (Is) = 3/4°
Dihedral, (Tr.) = 3.5″

Wing Section, (Sec.) = Grant X9
Fin Area, (A_F) = 30.24 sq. in.
Fin Height from Thrust Line, (Fu) = 3.5″
Fin Depth below Thrust Line, (F_L) = 4.5″
Leading Edge Above Thrust Line (Center Sect.), (L_F) = 3 1/4″
Trailing Edge above Thrust Line at Center Sect., (L_R) = 2 7/8″
Lower Fuselage Contour below Thrust line, (B_L) = 4.5″
Upper Contour above Thrust Line, (B_u) = 1″
Line of Thrust to Ground, (Q) = 9 1/2″
L.T. to Wheel Axle, (W_V) = 8″
Vertical Nose Line to Wheel Axle, (W) = 2.69″
Propeller Diameter, (D) = 12.5″
Propeller Depth (d) = 0.5″
Propeller Blade Width = 1.25″

Now we are ready to proceed. First determine what the scale of the layout is to be. Remember this is not a large detail drawing therefore a reasonably small scale may be used; a scale of 1/4″ to the 1″ is satisfactory.

The drawing may be started by laying in the side view outline already established around the force setup. This is to be in the lower right hand corner of the drawing, so to determine its position on the paper drawn lower and right hand border lines. Determine the total length of the fuselage then, allowing 1″ on the drawing between the right border line and the rear end of the fuselage, establish the position of the wing centerline on which the c.g. and c.l. will be located. Then allowing some space below the wheels, about 1/2″ between the ground line and the border draw in the thrust line horizontally and a line vertical to it through the c.g.

From these two baselines lay out the previously established outline of the fuselage, fin, wing mount, wing and wheels: The complete outline side view.

The next step is to draw in the structural units or other required features not shown previously. For instance, start by laying in the crosssection of the stabilizer around the stabilizer chord line, using the correct chord measurement of 6 7/8″. The stabilizer will have a uniform streamline chord section and its maximum depth will be 3/4″.

Next, some idea of the general structure including tail and rear of fuselage is required before the lower fuselage line, fin and tail details can be inserted. This is to be a simply constructed plane, a fuselage of four longerons with upright struts be-

ing used; covering will be sheet balsa.

The longerons should extend rearward to center line of the rear stabilizer spar. At this point it should have some thickness (not tapered to a vertical knife-edge) in order to form a firm basis for the stabilizer and prevent it from wabbling. The streamline form of the fuselage may be continued rearward to the end of the fin by cementing balsa blocks of proper contour on either side of the fin.

The fin is to be quite small so it will be made of sheet balsa with grain running vertically. Extend the lower fuselage contour across the face of the fin curving it upward to blend in with the fin trailing edge.

Now establish the position of the upright struts as shown in the side view drawing. Panels A, B, C are composed of bulkheads; panels D, E, F, G, H, I, J are struts. Place two struts I and J under the front and rear stabilizer longerons and another strut immediately in front of the stabilizer. A horizontal line drawn beneath the stabilizer indicates the stabilizer bed strut. With this construction the complete stabilizer and upper part of the fin can be built and assembled to the fuselage as a unit. It may also be detached as desired for transportation. Now other struts may be inserted at convenient intervals; these intervals should be smaller where stresses are concentrated, for instance at the forward part of the fuselage under the wing. You will note in the drawing that here distances between struts are less than at the fuselage rear.

If you have laid out the outline described in previous articles the wing (of Grant X9 section) will be shown at 3 degrees angle of incidence. It is to be attached to the body by a vertical pylon, as indicated, the structure of which must be determined before the parts can be drawn. One of the best forms of pylon is a single vertical member attached at the top and bottom of balsa blocks. Here this member will be constructed of 1/2" balsa sheet on either side of which is cemented 1/32" 3-ply birch or mahogany veneer. This vertical piece is marked "pylon" on the drawing. The base block is formed by cementing balsa blocks to both sides of the pylon's lower edge. Blocks cemented to the sides at the top will form the wing bed.

If it is difficult to visualize observe the front view drawing which shows the general crosssection of the pylon and its position.

The next step is to indicate the engine bed and mount. An excellent form of construction is one allowing the whole nose, engine unit and landing gear to be detached as a unit. This may be accomplished by assembling these parts to a vertical bulkhead which fits flush against the front bulkhead of the fuselage. This is indicated at A. The thrust line is the centerline of the engine shaft and the engine is mounted in an inverted position so it is entirely enclosed within the fuselage. Therefore the engine bed is laid in above the thrust line as indicated in the side view.

The rear part of the bed may be used to hold the batteries, coil, etc.; therefore it should extend from bulkheads A and B to bulkhead C. This will allow enough length for proper location of these units. The rear end can fit firmly into bulkhead C. It is advisable to have this rear part below the thrust line, so the battery and coil weights will be low, bringing the c.g. into correct position.

The bed may be made of two pieces 1/2" deep x 3/8" wide spliced as indicated. Upright braces will be cemented to the forward face of the engine bulkhead A in a vertical line with the engine bed. Over this on either side sheets of hardwood veneer V should be fastened.

The landing gear will be 3/32" wide shaped so a loop will pass upward in front of the engine bulkhead fastened to it by two or three metal clips. These details will be worked out later.

The next problem is to make the plan view layout. Proceed by establishing the wing centerline and the stabilizer center line 24" to the rear. The structure will be of orthodox design, the wing having two balsa main spars with transverse ribs of sheet balsa; also leading and trailing edge. Wing and stabilizer tips are rounded as shown. Other forms may be used, these are merely examples.

Without experience it is nearly impossible to explain in a satisfactory manner how to determine the position of spars, ribs, etc. in these units. Therefore examine the plane view drawing. Here these parts have been inserted in correct manner and will serve as an example for you in the future. You will note that the ribs are closer together near the center of the wing. Space the ribs evenly from the tip toward the center then if measurements do not allow even spacing up to the center insert the ribs at smaller intervals as indicated.

The width of the body is determined by the required contest crosssectional area. The formula is: crossectional area should equal $\frac{L^2}{100}$; L is length of fuselage from propeller bearing to tip of tail. A body width of 2 1/2" will be satisfactory, giving more than necessary crosssection. With this known, lay in the plan view outline of the fuselage which is symmetrical on either side of the thrust line, L.T.

Draw in the wing, tail and propeller to measurements specified in the table of aerodynamics requirements.

It is a simple matter now to lay in the front view. The first step is to draw the wing with proper dihedral. A horizontal line is drown from B, the center point of the leading edge, then at tips. The latter are to be raised 3 1/2" according to our table. Therefore the leading edge *extended* must be elevated 3 1/2" at the tips. You will note that the upper line of the wing representing the highest point of camber is extended all the way to tips and that the undersurface tapers up to it; consequently if the measurement is to be taken at the wing tip as shown, another 1/2" must be added, for dihedral of 3 1/2" was taken as a distance from leading edge at the tip to a horizontal line passing through leading edge at the wing center.

Another thing to consider in the front view is the wheel tread. A good rule to follow is: make the point of wheel con-

tact with the ground, about on a line through the center of the lower fuselage contour which is 45 degrees to the vertical fuselage centerline. In this case it gives a tread of approximately 10".

Now that the general character of the structure and position of parts has been determined, the only other consideration is to choose correct part sizes. These are established by the stresses involved and require considerable experience.

Next month we will try to give a few hints and short cuts in designing the structure, showing how to calculate the correct crosssection for wing, spars, ribs and other parts. Till then, Happy Landings!

VICTORY

Flash News

(Continued from page 26)

Lee Norden, 42, pioneer automobile racing driver and private pilot renowned for his invention and development of the famed bomb sight bearing his name, died of pneumonia. First invented several years ago, the Army has continued secret development of the mysterious bomb sight to its present stage at which it is claimed to be the most efficient in the entire world.

Major General Henry H. Arnold, Chief of the Army Air Forces, announced his command has 2,500 modern combat planes ready for instant action. This does not include the more than 5,000 training and obsolescent types still in service and useful in an emergency. Among other extracts from his West Point address: "We have now reached the mass production stage on the Bell P-39 and Lockheed P-38 types which are superior to British and German pursuit planes. However, our new Republic P-47B fighter eclipses both in performance and climb. We now have eight large bases in the North Atlantic region and three in Alaska."

A mysterious fire destroyed two Army sailplanes and three others in the Frankfort Sailplane Company factory at Joliet, Ill. Parts for 25 more with valuable dies, jigs, patterns and forms were destroyed.

Vultee has purchased Consolidated. That is the news according to completion of lengthy negotiations between the two firms. However, FLASH NEWS has just completed lengthy investigation of the deal and here are the facts, you make the conclusions: Major Reuben H. Fleet, President and long-time manager, has sold his holdings of 440,000 shares of Consolidated (held by himself and family) to Vultee for $10,065,000, which, including a recent dividend of $2.00 per share, means $22.87½ per share. The deal calls for cash payment of $9,280,000 and balance in Vultee stock. Vultee, to make this payment, will issue about $6,000,000 worth of stock for public sale and sell 150,000 shares of preferred stock to Aviation Corporation at $10 a share. All of which is well and good except that Vultee recently borrowed $6,000,000 for operating capital from Chase National Bank in New York City which owns the entire corporation, including the former Barkley-Grow firm of Detroit and the Stinson Aircraft Company of Wayne, Mich., and Nashville, Tenn. This brings the one billion dollar Consolidated firm into the fold and we are waiting for the next move towards the purchase of additional firms.

Berlin has erected a series of mysterious anti-aircraft towers about the city according to confidential reports. Centered in Tiergarten Park, hit heavily by R.A.F. raiders, the towers are expected to ward off future raids on the German capital.

Flight Lieutenant Chesley Gordon Peterson of Utah has been named commanding officer of the world renowned American Eagle Squadron of the Royal Air Force. First American to command the unit, Peterson, only 21 years old, with five victories to his credit, has been awarded the Distinguished Flying Cross for heroic air action. There are now a second and third American Eagle Squadrons in the Royal Air Force due to the

host of applicants for duty with the group.

Interstate Aircraft and Engineering Corporation of El Segundo, Calif., has made a novel move in hiring a score of deaf-mutes for detail machine-tool work. Manufacturers of primary training planes, gun chargers and various ancillery items, the firm has had remarkable experience with men who can neither hear nor talk and to whom instructions are given in sign language by Crew Chief Hamblin.

Naval Aviation construction and outfitting of more than thirty Atlantic and Caribbean air bases will be completed by the Spring of 1942, states Representative Jacobsen of Iowa, in charge of a recent inspection tour.

In the face of terrific pounding of Italy by R.A.F. long range bombers, Mussolini has replaced General Francesco Pricolo as commander of the Italian Air Force with General Rino Corso Goufier, who also takes over the duties of undersecretary of Aviation and Chief of Staff for Air.

Simon Guggenheim, sixth of the seven famous Guggenheim brothers who built a tiny western smelter into one of the world's greatest mining empires, died of pneumonia. With his brother Daniel he founded the great aeronautical research and educational fund bearing the latter's name. Daniel Guggenheim Foundation Schools of Aeronautics are located at Massachusetts Institute of Technology, California Institute of Technology, Georgia Technological Institute and the University of Michigan and hundreds of today's aviation leaders and scientists were graduates of these schools.

The 72 aircraft of the United States Coast Guard have been placed under the command of the U. S. Navy in accordance with Roosevelt's recent proclamation that the Coast Guard will serve as a part of the Navy throughout the war. Although most of the Coast Guard aircraft types are amphibians and special rescue planes, they are being assigned to Utility Squadrons with Naval Aviation and will continue their valuable life-saving work.

Roger Lescoulie recently had breakfast in England, lunch in Canada and dinner that night in England again, becoming the first ferry pilot to complete a round trip crossing of the Atlantic in the same day. Total time just 19½ hours. New record for the one-way crossing was set recently by a Consolidated Liberator four motor long-range bomber which negotiated the distance in just 8 hours 23 minutes.

Named by high ranking officers as the "year's greatest achievement in aviation" is the Marston strips, a portable landing mat consisting of metal grating strips 10 feet long and 18 inches wide. A special test assembly was laid down at Hoffman, N. C., during recent Air Forces maneuvers and dozens of planes tested the strip for nearly a week. Chief advantage is mobility, wear-saving qualities on aircraft tires and non-slip advantage during rainy weather.

The Amelia Earhart Memorial Civic Club has been formed in Chicago to obtain funds with which to purchase ambulance planes for the Royal Air Force in memory of the famed woman flier lost in the South Pacific several years ago. Grumman amphibian planes will be purchased and carry the aviatrix's name.

A Consolidated Catalina twin engine flyingboat recently made a non-stop flight of 3,300 miles from Canton Island to Sydney, Australia. This distance is believed to be a record for a service type flyingboat with no special installations of fuel.

Boner of the month was the recent escapade of Corporal Albert Moxley, attached to the 60th Pursuit Squadron at Mitchell Field, Long Island, N. Y. While riding as passenger in a North American BT-14 training plane over the Statue of Liberty, Moxley saw pilot Lieut. John A. Kelting motion with his arm towards the ground. Moxley promptly went over the side, opened his parachute and landed in mid-air suspended from the third story cornice of a Brooklyn apartment house. After his rescue he was told that Kelting had only been pointing out the Statue of Liberty!

Jack M. O'Meara, 32, well-known glider pilot, lost his life in the crash of an experimental PC-6 low-wing basic training monoplane built by the Harlow Aircraft Company of Alhambra, Calif., for whom he worked as test pilot. The ship lost its wings at 6,000 feet and plunged into a hillside, bursting into flames. O'Meara won two consecutive international glider meets and was recognized as an outstanding glider figure throughout the world.

First Vultee-designed Northrop-built Vengeance dive-bomber has completed flight tests and dozens more are nearing completion. After eight months of tooling for the job during which engineers of Vultee were "lent" to Northrop, production on the new two-seat single engine monoplane, which outclasses the Nazi Stuka type almost 100%, is increasing daily.

Long Beach has become the Pacific Coast center of the Air Ferry command under Colonel Robert Olds, pioneer Flying Fortress expert. Ferry command not only is being trained to ferry completed Army planes to their assigned bases but to fly R.A.F.-bound bombers and fighters to takeoff points in Newfoundland. Auxiliary route development across the South Atlantic to North Africa is being speeded.

A Lockheed Hudson was recently partially wrecked, not by a Nazi fighter plane, but by a San Pedro, Calif., pedestrian! The plane, mounted on a huge truck trailer, was being transported minus wings to the San Pedro harbor area for stowing on a ship when the jaywalker stepped in front of the truck. The driver swerved, crashed into a telephone pole and the Hudson slid forward over the roof of the truck. The plane was returned to the factory with a badly crushed lower surface and damaged tail assembly.

Facts and figures on aircraft manufacturers: Douglas Aircraft has a backlog of $714,173,000, employs 33,463 men and women; Vultee has backlog of $158,000,000 and 9,400 employees; North American has a backlog of $145,583,000 and 14,521 employees; Lockheed has a backlog of $382,112,057 on which 39,930 em-

ployees are working; Vega (Lockheed subsidiary) has a backlog of $254,500,000 and 11,900 employees and Northrop has 3,250 men working on $74,873,159 worth of planes and parts.

The giant Martin XPB2M-1 seventy-ton flyingboat was seriously damaged by an accident during preliminary water-taxiing tests prior to delivery to the Navy. The propeller of No. 3 engine broke loose and crashed into the hull, then the engine broke loose and dropped into the water while the fuel cells caught fire. The wing was severely burned, damage estimated at $50,000. The accident will delay acceptance tests by the Navy for two months it was stated.

Captain John R. Alison and Lieut. Hubert Zemke of the United States Army Air Force have been stationed at Kuibyshev, Russia, for the past several weeks training Russian pilots to fly American-built combat planes. The two officers give the Russians brief instructions and check them out in the Curtiss Tomahawk and Kittyhawk fighters. More than one hundred planes have been assigned to Russian pilots and flown away from the field without damage reports Colonel Borris Smirnov, Russian commander of the squadron using the American planes.

Captain James Philpott, attached to Army Lowry Field (Denver) Base, recently covered 1,800 miles to New York in 4 hours 43 minutes at an average speed of 382 miles per hour in a Republic P-43B single-seat pursuit plane, new standard type now going into service. "At no time was the throttle wide open" he commented. He said he did better than 600 miles per hour in a shallow test dive during the trip.

More than 2,500 combat planes are being produced monthly in the United States, half going to Britain, it was recently revealed. This means the United States Army Air Forces are receiving nearly 1,800 airplanes each month. Lack of propellers are making this delivery rate slightly less, however, as hundreds of Bell, Martin and Lockheed planes are sitting in long rows awaiting delivery of this badly needed part. Situation is being rapidly improved, however, with Hamilton Standard's new plants getting into high gear. More than 5,000 engines are now being built monthly by Wright, Pratt & Whitney and Allison concerns with production peak still not in sight.

According to New Zealand Secretary of Air Thomas Barrow, Canada, Australia and New Zealand are now training 10,000 air cadets monthly and there is a total of 160,000 fully trained air-men on hand. "With increasing supply of American planes coupled with England's enormously increased aircraft production rate, there is every evidence that Great Britain's Royal Air Force can have such a cloud of planes over Japan and Europe that a definite and final victory is assured before the year 1943."

The Army's first glider school is rapidly nearing completion at Twentynine Palms, Calif., in the famous dry lake bed region of Southern California. First Lieutenant Floyd Sweet will be in charge, activities of which were recently transferred from Elmira, N. Y., due to weather conditions at the latter field during winter months. California's year-round sunshine makes possible completion of training of the first dozen in four weeks with two, eight and fifteen-place gliders.

When the new Vought-Sikorsky XF4U-1 was being tested an unusual event in the procedure caused old-timers to practically swoon. The ship was warming up on the apron and, in keeping with good practice, a mechanic opened up the motor to see that all was in readiness. As soon as the 2,000 "horses" really got roaring the XF4U-1 promptly tipped up on the left wheel and wing-tip, so great was the torque effect. As a result the pilots of these swell ships start their take-off at a bit less than half-throttle.

— VICTORY —

Skywriters Library

FLYING FLEETS. By S. Paul Johnson (Duell, Sloan and Pearce, $3.00) 219 photographs, 188 pages.

No history of Army or Naval Aviation can better be told than with photographs, and in this respect FLYING FLEETS is most complete. The latter half of the book contains more than two hundred graphic illustrations of the Navy's planes from 1911 to the latest designs now flying. It takes an old-timer to tell a complete and accurate history and S. Paul Johnson, of the

N.A.C.A., is certainly that. First few chapters contain an analysis of the tactical duties of naval airplanes outlining in detail what is required of them and how designers have met this challenge with Navy planes that are without peer for their particular job. Lighter-than-Air ships get their full share of the spotlight also, with photographs and detailed information on their history and future. Certainly this book is one of the most valuable yet published to the student of Naval Aviation, particularly to the man contemplating a future with our Navy's FLYING FLEETS. The photographs, many never before published, are worth the price alone. This book will tell you why American Naval Aviation is the world's most efficient and best prepared flying arm.

THE AIRPLANE AND ITS ENGINE. By Chatfield, Taylor and Ober (McGraw-Hill Book Co., $3.00) 401 pages.

If the engine is the heart of the airplane, then THE AIRPLANE AND ITS ENGINE is the heart of an aviation student's course in required reading. These three men are outstanding authorities, Chatfield being United Aircraft's Director of Research and Taylor and Ober being Massachusetts Institute of Technology Engineering Professors. Each has contributed a share of the book which, taken as a whole, is a complete course in airplane mechanics. Although greatest emphasis has been placed on the airplane power plant, aerodynamics is given a thorough discussion in the early chapters. Illustrated by hundreds of remarkable photographs, drawings, charts and graphs, this book could start a youth on an aviation career. Every subject from fuel-injectors to giant flying boats is covered in simple, easy to understand language and the most complicated engine accessory is explained in a manner clearly comprehended by the layman. Certainly a valuable handbook to all those who design, build and fly airplanes.

LIGHTPLANE FLYING. By Wolfgang Langewiesche (Pitman Publishing Company, $2.50)

The subject of lightplane flying and its use for business and pleasure has recently come in for a great deal of attention, and no more outstanding authority on the lightplane's operation could have been chosen to write on the subject than Mr. Langewiesche, who has been flying for more than fifteen years and has covered most of the world in his lightplanes. Arriving in this country, he chose the lightplane as the quickest and cheapest way of getting acquainted with America and this book tells his story. It includes everything from how much your lightplane will cost to operate to safe maneuvers and cross-country flight trips. If you are contemplating learning to fly, buying a lightplane or just warming to the subject of flying this book will convince you you're on the right path. Langewiesche tells simply and clearly in an almost poetic manner of speech the hows and whys, do's and don'ts of lightplane flying.

SIMPLE AERODYNAMICS AND THE AIRPLANE. By Colonel C. C. Carter. (Ronald Press, $4.50) 510 pages, 300 illustrations.

No aeronautical engineer or designing draftsman in the aircraft industry can say he has never heard of "Carter's Aerodynamics" for this volume for many years has been the basic textbook of aeronautical engineering courses throughout the country. It is a huge book complete with photographs, charts and graphs and its pages of airfoil characteristic curves are almost invaluable. Every conceivable detail of the subject of aerodynamics is discussed with a clear analysis and a simple, straightforward method of presentation. From its original organization as a textbook for aerodynamics students at West Point, this book has been repeatedly enlarged, reorganized and freshened to include the latest developments in the field. Although the subject is indeed a lengthy and technical one, this book would serve a serious-minded and mentally-active student as a complete course for home study. It contains an exhaustive study ranging from the simple airflow around blocks of wood to the design of the military airplane for specific performance characteristics. The standard reference book for the aeronautical engineer.

VICTORY

Air Fighters of the "Setting" Sun

(Continued from page 4)

est of the seven major nations involved, depending upon imports for the major portion of supply. Her production of iron, steel, magnesium, tin, lead and aluminum is only a fraction of actual need and her last great source of these vital aircraft materials has been cut off. To work these into aircraft parts Japan has comparatively little natively-produced machinery and machine tools. In 1936 Japan imported $15,000,000 worth of lathes, mills, presses and other machine-tools. By 1940 this had climbed to $70,000,000 compared with the $1,050,000,000 vitally-needed machines operating in the United States.

An acute shortage of skilled mechanical labor has always hindered the Japanese war machine production effort. Training for these jobs is a long, laborious process with two full years of intensive training considered minimum before men are permitted to operate this expensive and irreplaceable machinery.

In 1936 only 187,000 Japanese machinists and skilled workmen engaged in national defense production, less than 10% of which were employed by the three principal aircraft factories: Kawasaki (ship-building firm), Mitsubishi (munition manufacturing trust and the largest aircraft factory) and Nakajima (oldest aircraft firm, formed in 1914). Last year's estimate was 85,000 aircraft workers throughout the empire (including sub-contractors working on various other military production). Compare this with 650,000 aircraft workers in the U.S. Thus, without raw materials, adequate machinery or skilled machinists present Japanese aircraft industry is producing only 200 planes per month, less than 2,500 per year (our present monthly production of all types).

The Japanese Airforce is not unified, the Army and Navy having separate com-

mands. Headquarters of all military aviation is in Tokyo with Army and Navy command fields located at Tachikawa Army Flying Field and Yosicuzo Navy Field, both adjacent to the city. Directing all Army flying units, Lieut. General K. Kosoh is assisted by Major General M. Koseki, in charge of supply and training. Experimental testing base is located at Tokorozawa, basic and advanced training flying school at Kumagaya, fighting school at Akenohara, bombing school at Hamamatsu, and observation and gunnery school at Shimoshizu. In charge of Army aviation is Lieut. General Baron K. Tokugawa, who directs the activities of Japan's sixteen Army aviation regiments (wings). Military targets for U. S. and British bombing raids will be the following military flying fields: Number One and Number Two Air Regiments at Kagamigahara (Gifu), Number Three Air Regiment at Yokkaichi (Miye), Number Four Air Regiment at Tachiarai (Fukuoka), Number Five Air Regiment at Tachikawa (Headquarters Field near Tokyo), Number Six Air Regiment at Heizyo (formerly Seoul, capital of Chosen or Korea), Number Seven Air Regiment at Heitogai near Tainan, capital of Formosa, Number Eight Air Regiment at Hamamatsu (Shizuoka) and Number Fourteen Air Regiment (a composite unit) at Kagi, also in Formosa.

There is a balloon station and school at Chiba (Chiba). (Note: The name of the state follows the cities mentioned above for simplicity of location.)

Other military airdromes are located at Akenohara, Kumagaya, Osaka, Tokorozawa, Shimoshizu, Uyeda and Kagamigahara. Due to Japanese government military restrictions, no information relative to fields set up in Manchoukuo or occupied China is obtainable, although it is known that more than 30 such fields are now in operation.

Naval Aviation command resides in Vice-Admiral K. Oikawa with headquarters in Tokyo. Naval Aviation is a part of the Navy and naval aviators are Navy men. Prime targets of our Navy dive-bombers and far-ranging battleship guns will be the following Naval Aviation bases: Chinkai (in Korea or Chosen), Kanaya (Kagoshima), Kasumigaura (Ibaraki), Kisaruzu (Chiba), Kure (Hiroshima), Maizuru (Kyoto), Ohminato (Aomori), Ohmura (Nagasaki), Rojun (protectorate of Port Arthur), Saheki (Ohita), Saseho (Nagasaki), Tateyama (Chiba) and Yokosuka and Yokohama, both in Kanagawa.

Japan's Naval Aviation is divided into three air divisions commanded by Rear-Admiral S. Sato (First Air Fleet), Captain R. Horiye (Second Air Fleet) and Rear-Admiral R. Tokari (Third Air Fleet). These air fleets are divided into battle forces assigned to aircraft carriers (two carriers to each Air Fleet, three to the Third). Japanese aircraft carriers are greater in number, lower in accommodations, less heavily armed than American ships. The Hosho displaces 7,470 tons, has a speed of 25 knots, two anti-aircraft guns. The Akagi with twin Kaga displaces 26,900 tons, has 12 anti-aircraft guns, a speed of 28.5 knots. Fastest of the Japanese Fleet, it is slower than slowest American carrier, most of which speed along at 30-33 knots, fastest vessels of comparable size in the entire world. Rujyo, the smallest Japanese carrier, displaces 7,600 tons, while the Soryu and Hiryo displace 10,000 tons and have just recently been commissioned. These carriers, with two building, carry less than 50 planes as compared with the U.S. 80-85.

In addition are Japan's three flying boat tenders, the Kamoi of 17,000 tons, Notoro of 14,050 tons, and the tiny Chitose of 9,000 tons.

Due to the aircraft shortage, Japanese pilot training has been slowed to prevent an over-supply of pilots becoming inactive while waiting for planes to fly. Pilot training rate in Japan has risen, however, from less than 1500 per year in 1936 to more than 5000 per year more recently. This, however, includes observers and gunners, who are also required to have a knowledge of piloting.

The skill and aptitude of the Japanese pilot is notoriously poor as evidenced by the extremely high casualty rate of landing and take off accidents. Of 426 Japanese airmen lost in China-war in 1939, 60 were lost due to ground-handling accidents, almost 15% of the total. Japanese marksmanship and gunnery efficiency has the lowest rating of the seven major airforces, largely because of congenitally poor eyesight and lack of aptitude in calculation of speed, drift, wind and distance between plane and target. This verified fact has caused considerable speculation by Army and Navy officials as to the possibility of German airmen manning the bomb-sights of the Japanese planes which so successfully attacked Pearl Harbor, Hickam and Wheeler

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Fields that fateful Sunday morning. Reports of captured German airmen in these regions have not been confirmed, however.

The main Japanese weapon is not an airplane, gun or bomb, but obedience with which the people are drilled from infancy. This dumb animal training precludes initiative in emergency and works backwards eventually.

The Japanese Airforce was largely French-trained until 1937 when a huge German military training mission arrived and for the past three years has almost completely reorganized the strategic and tactical use of air power. At that time the Army Airforce consisted of 12 pursuit squadrons, 12 reconnaissance squadrons, six bombardment squadrons and a balloon corps. There were a total of 10,207 officers and enlisted men and 1,325 military airplanes of all types in service.

The Naval Aviation force consisted of 6 fighter squadrons, 8 scouting squadrons, 4 bombing squadrons and 2 utility squadrons. There was a total of 6,480 officers and enlisted men and 682 naval planes of all types in service. Totals at present are not available, naturally, but authoritative estimates credit combined totals close to 5,000 airplanes and 50,000 officers and enlisted men; a formidable force.

The Japanese aircraft industry has, throughout its history and almost without exception, copied designs of other countries, some acquired by purchase of license rights for manufacture of British, German, French and American planes. Particularly are their aircraft engines manufactured replicas of existing types formerly in use here and in Europe. Due to policy of releasing aircraft and engine designs only after they have become obsolete for service by major nations, Japan has at no time had modern aircraft comparable with American, British or German types. She has yet to produce a 300-mile-per-hour fighter or a 1,000 horsepower aircraft engine.

Army Types

Fighters.—The Nakajima 91 is a single seat, high-wing monoplane powered by a single Nakajima "Kotobuki III" engine developing 450 horsepower. This engine is the outmoded Bristol "Jupiter" engine manufactured under license. The ship had a top speed of 198 m.p.h. and could climb to 16,000 feet in 10 minutes. These ships are now being used for pursuit training. The Kawasaki 92 was the first of a standard line of single seat biplanes copied after the Curtiss "Hawk" types.

This ship is powered by a Kawasaki engine built under license from the German B.M.W. concern. The type was improved, resulting in the "95" produced in 1935, powered by a 600 horsepower Kawasaki B.M.W. liquid-cooled engine and featuring famed Vincent Andre controlled-shutter radiator for cooling purposes. It has a top speed of 196 m.p.h., a range of 480 miles. Latest type, now standard, is the Mitsubishi Type 96 single seat monoplane patterned after the famous Boeing P-26 now obsolete in the United States. Wingspan is 36 feet, length 24 feet 7 inches. This ship, of which hundreds are in service, is powered by a Mitsubishi A-14 engine developing 800 h.p., giving the ship a top speed of 245 m.p.h. It has a fixed single strut landing gear with streamlined "pants". It has been reported that Germany has released 100 Messerschmitt Me-109 single seat fighters to the Japanese Army airforce and now they are in service. While this report has not been confirmed, this Me-109 is the early model of the ship which created such havoc in 1939-40. It has a top speed of 354 m.p.h., armed with a 23 millimeter shell-cannon in the nose in addition to four 7.7 millimeter machine-guns mounted in the wings.

Observation—Main observation type is the Nakajima 94 two seat biplane powered by a 550 horsepower Kotobuki radial, air-cooled engine, with wingspan of 40 feet, and is 26 feet long. Maximum speed is 185 m.p.h. and can climb to 10,000 ft. in 9 minutes. It has a ceiling of 26,240 ft., and, as with all observation types, is equipped with light bomb racks to carry 10 twenty-five pound fragmentation bombs. Rear gunner is mounted in old-style Scarff gun-ring mount with single 30 caliber weapon. This ship is actually a sesqui-plane with short lower wing. Its upper wings are characterized by a straight leading edge and elliptical trailing edge. Type 92 is an earlier model of the same machine powered by a 400 h.p. model of the Kotobuki engine.

Light Bombers.—Japanese Army light bombers are actually reconnaissance types fitted with heavy bomb racks and carrying a greater fuel load. Main type now in use is Kawasaki Type 93 biplane powered by a 700 h.p. Kawasaki B.M.W. liquid-cooled engine, actually a two-seat redesigned edition of the Army type 95 single seat fighter. Wingspan is 42 feet 8 inches and is 32 feet 9-1/2 inches long. With 6,820 pounds full load it has a top speed of 161.5 m.p.h., climbing to 9,840 feet in 12 minutes, with a 22,960 foot ceiling. Hundreds of this type are now in service, doing most of the bombing of Chinese civilians and unprotected areas. Also there is the Mitsubishi "Otori" four-seat twin engine monoplane powered by two Nakajima "Kotobuki III" air-cooled radial engines developing 550 horsepower each. The ship has twin rudders and fully retractable landing gear identical to the Douglas DC-3 design of

this country. It has a bomb load of 860 pounds and top speed of 220 m.p.h. A commercial model of this machine has flown non-stop from Tokyo to Bangkok, more than 2,000 miles, an indication of its range.

Long-Range Bombers—Several outstanding long-range bombers have been developed through the five-year-old China war, most of which have been patterned after obsolescent German types. The Mitsubishi "Kinsei" is the standard type, closely resembling the German Dornier Do-17 twin engine monoplane, although not approaching the latter's performance or load figures. This type is powered by two Mitsubishi "Kinsei" radial air-cooled engines of 900 h.p. each. The type 96 has a wingspread of 82 feet and is 52 feet 6 inches long, weighing 11,000 pounds fully loaded including disposable load of 1,827 pounds. Top speed is 204 m.p.h. and cruises at 162 m.p.h. It has twin rudders and features typical Dornier suspended trailing edge aileron and single strut, fully retractable landing gear. Latest and most deadly Japanese Army bomber is Nakajima Type 19 powered by two Mitsubishi IV radial air-cooled engines of 870 h.p. each. This ship is a development of the Douglas DC-2, for which it has a license to manufacture, a huge monoplane with fully enclosed cabin, fully cowled engines and typical Douglas retractable landing gear. Wingspan is 72 feet 2 inches, and it is 50 feet 9 inches long, power is delivered by three-bladed, constant-speed, all-metal propellers. Type 19 weighs 10,450 lb. empty and, with a bomb load of 2,550 lb., has a gross weight of 14,260 lb., top speed is 217.3 m.p.h. and cruises at 186.3 m.p.h. This one can climb to 28,600 ft. and has a range of 2,500 miles. It is easily the most deadly of Japanese machines and one for which we should have greatest respect, although it does not compare with modern American or British types.

According to various sources there are a number of more modern Japanese Army planes, particularly the Nakajima type 97 single seat fighter, the Mitsubishi type 4 long-range bomber and Tokyo Gasu Denki long-range bomber. However, little data on these is available due to strict Japanese censorship. The extent of German or Italian planes in use by the Japanese is also unknown although it is barely possible Italian Fiat fighters and Savoi-Marchetti bombers and Messerschmitt fighters and Heinkel or Junkers bombers from the Luftwaffe have found their way over the perilous routes across Asia to the Japanese Airforce.

Navy Types

Fighters.—The Kawasaki Army type 95 is also used by the Navy, powered by a Kotobuki 550 h.p. air-cooled radial engine. Chief Navy fighter is the Nakajima AN-1 single seat monoplane, exact replica of the Boeing P-26A with but one small modification: a sliding, glass-enclosed hatch over the cockpit. The ship has a wingspan of 35 feet 5 inches and is 24 feet 5 inches long; weighs 2,650 pounds empty and 3,270 pounds fully loaded. Top speed is 261 m.p.h. and can climb to 16,400 feet in 6 minutes 9 seconds. It has the familiar P-26 wire-wing-bracing and neatly panted single-strut landing gear. The Nakajima III air-cooled radial engine develops 550 h.p., fully cowled. The Mitsubishi Army Type 96 fighter serves also aboard Naval aircraft carriers in considerable numbers.

Bombers.—Japanese Naval bombers are all float-equipped, which can be changed into wheel-gear for aircraft carrier work. Chief is the Mitsubishi type 94 biplane, a copy of old Martin TM-1 and Great Lakes TG-2 torpedo-biplanes used by our Navy more than five years ago. These huge planes have a wingspan of 64 feet 2 inches and length of 42 feet 8 inches, weighing 6,800 pounds fully loaded, carrying a single 1,000-pound torpedo in a special sling below the lower wing between the landing gear. It has a top speed of 146 m.p.h. and range of 860 miles. The Nakajima Army Type 94 biplane serves also as a seaplane with a lower performance. It also handles an aerial-type torpedo. An earlier type, the 92, powered by a 500 h.p. engine of the same time, is still used in small numbers, identical to the Army type 92 with twin float gear.

Scout-Reconnaissance—Most Navy scout planes are converted Army types, among which are type 95 used as a Navy bomber (above), the 94 flown by the Army as a light-bomber, and the Navy type 90, an early Mitsubishi biplane two-seater equipped with floats. A new twin engine scout plane is the Mitsubishi type 96, land-based, long-range coastal-reconnaissance type. This machine is similar to Army Type 96 described above but has a cruising range of more than 2,500 miles; some have been float-equipped.

Patrol-Bombers—Few know of Japan's development of the giant flyingboat, but she has a powerful long-range patrol bomber section in her Navy. In widest use is Kawanishi Type 90-2 tri-motor monoplane flying boat, a giant ship developed from an early Short (British) flyingboat; it is a monoplane with a flyingboat hull and three Rolls-Royce engines of 825 h.p. each, mounted in nacelles above the wing. This huge plane has a wingspan of 126 ft., weighs 22,000 pounds fully loaded, a crew of six-eight and range of 3,000 miles. It carries 4,000 lb. of bombs or torpedoes. Hundreds of these ships are in service and compare in range and weight with our Consolidated PBY types. However, top speed is only 114 m.p.h. and they are inadequately armed against aerial attack. Kawanishi, the most widely-known Japanese flyingboat builders, also produced the type 91 flyingboat powered by two Rolls-Royce engines, also similar to a smaller Short twin engine flyingboat. A newer model is type 96 flyingboat developed from the famous Short flyingboat powered by four Rolls-Royce engines mounted in pairs with one engine tractor and one engine pusher in the same nacelle. Little is known of this type, particularly how it compares with the British Short biplanes of six years ago, after which it was copied.

Fuel has been an acute Japanese problem, more than 60% of high octane aviation type was imported from the United States over the four years previous to the State Department action cutting off this trade. This action took place nearly a year ago and fuels with a rating of less than 90 octane are unsatisfactory for aircraft engines developing more than 500 horsepower. Low-octane fuel will impair engine performance often as much as 30%, and Japan has not adequate supplies of even this low grade fuel.

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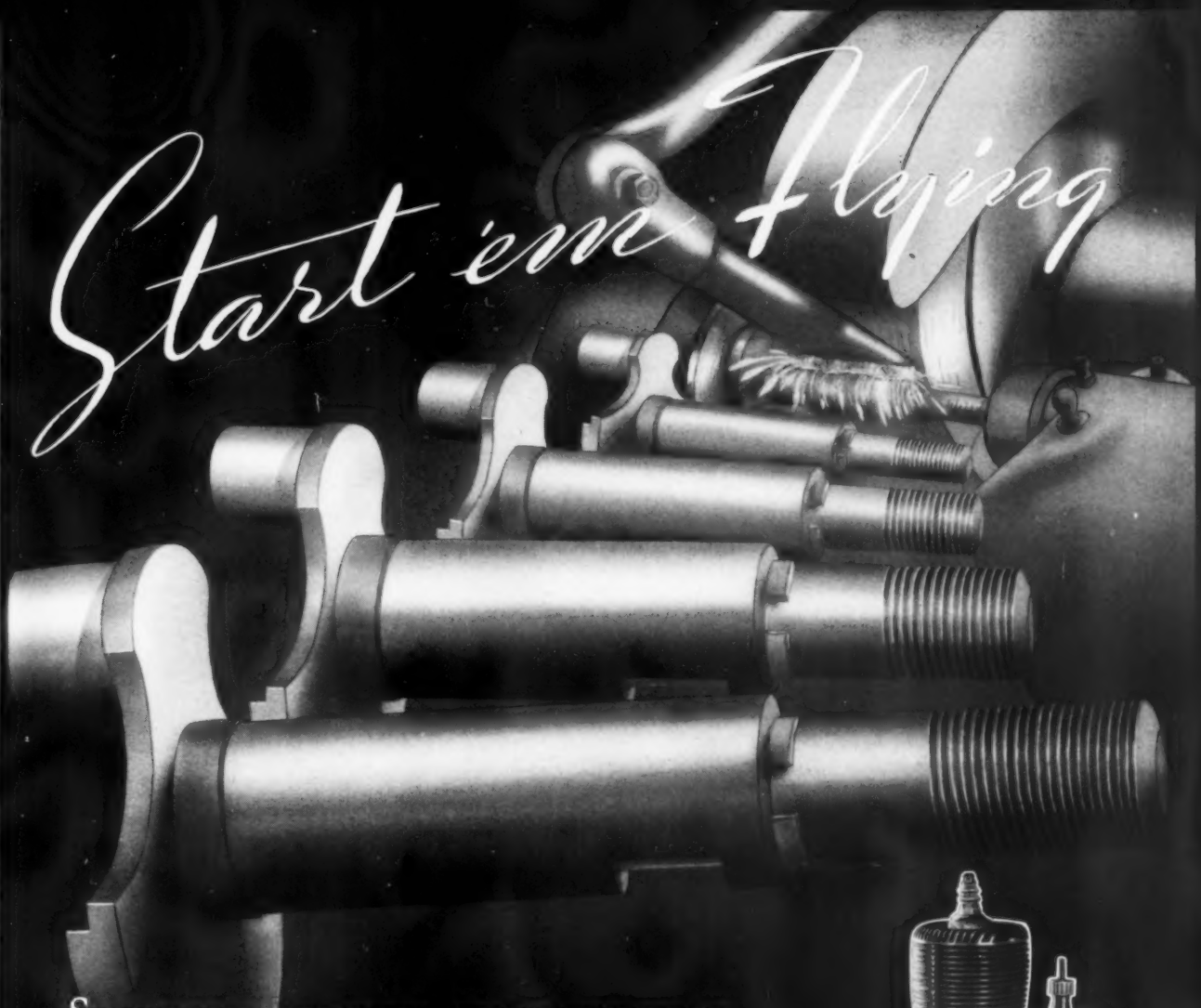

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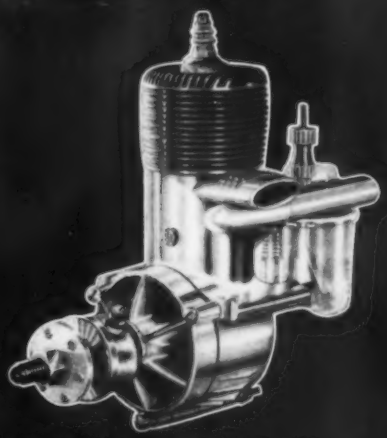

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Thus we see that Japan has an air force technically low in efficiency, strength and tactical flexibility. It has a considerable number of airplanes and an even greater number of pilots who are inherently ill-equipped to do the highly specialized and scientific job of air-fighting. However, the Japanese fighting man is a dangerous, treacherous and obstinate foe. He is a stronger man, pound-for-pound, than an American or British pilot, with a singleness of purpose and a reckless abandon which makes him an evil opponent. Thus, we can no more underestimate Japanese air power with its out-dated and inefficient airplanes manned by a treacherous, cunning airman than we can an unarmed cobra.

To combat this hissing menace stand the men and planes of the British, Chinese and American Far East Airforces. British Spitfire and Hurricane eight-gun, 400-mile-an-hour fighters and Blenheim and Hampden 350-mile-an-hour medium bombers at Singapore and Hong Kong naval bases are already in action.

China's modern airforce equipped with American Curtiss fighters and Martin bombers can certainly be depended upon to hold its own, as in the past. Chief foe of Japan's aerial might in the Pacific, however, is the mighty United States Army Air Forces and Naval Aviation units stationed in Hawaii, the Philippines and aboard the battleships, cruisers and carriers of our powerful Pacific Fleet. At huge Pearl Harbor are the 21st, 22nd, 23rd, 25th and 26th Patrol Wings of the Navy, equipped with today's most deadly flying-boat—the Consolidated PBY, whose 4,000 mile cruising range and 2,500 pound load of bombs and torpedoes are potent defenders of democracy. Here, also, are the 400-mile-per-hour Curtiss P-40 single seat pursuit planes with six machine-guns of the Army's 4th Pursuit Wing at Wheeler Field, Hawaii, and the deadly Boeing B-17 Flying Fortress long-range bombers, the world's most dangerous warplane, whose 10,080 pounds of concentrated destruction might easily lay Tokyo prostrate under attack of a single squadron, of the 18th Bombardment Wing at Hickam Field, Hawaii. In addition there are the many pursuit and bombers, out-dated by our present air force standards, but a match for Japanese equipment, of the Philippine Army, which owes so much of its present size, strength and efficiency to General Douglas MacArthur, now in command of our Far East forces.

Movements of ships, men and supplies are confidential and therefore nothing can be revealed concerning the shipment (and flying!) of more planes, men and supplies from the Los Angeles-San Diego area, but it is certainly most logical that these mass ship movements are under way, convoyed by our powerful Pacific Fleet, also en route to the scene of action.

As this is written, Russia has not yet openly severed its ties with Japan, but we can be most certain that when it does, its strategic location in behind the Sea of Japan will become a lovely duck-blind from which Uncle Sam will bring down slant-eyed birds by the thousands.

Australia's sizable airforce and Canada's giant aircraft production industry are openly at war with Japan. Canada's fighters and bombers are being ladled into Alaska and from there will spring the attack on Tokyo, Yokohama, Hakodate and Osaka. Australia aerial units are today moving up into Dutch and British East Indies bases, from whence they will join the Philippine forces of defense. India's Airforce, reinforced by Royal Air Force units, is flying into Burma and from there into China. Most assuredly, Japan is encircled, and by vastly superior air forces. Most assuredly, these forces will crush her beneath the wheel of her own war machine. Most assuredly she has, under orders from Hitler, embarked on a course of self-destruction, but she has resolved to take the greatest possible toll of men and machines in the process. Most assuredly it will be a long fight, a deadly, savage maelstrom of destruction that will cost each of us dearly. But most assuredly the spiritual force of liberty-loving peoples will crush forever the military power of freedom's greatest enemies: Hitler, Mussolini and Tojo!

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